



EUROPEAN COMMISSION  
DG Competition

***Case M.9205 - IBM / RED  
HAT***

Only the English text is available and authentic.

**REGULATION (EC) No 139/2004  
MERGER PROCEDURE**

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Article 6(1)(b) NON-OPPOSITION  
Date: 27/06/2019

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EUROPEAN COMMISSION

Brussels, 27.6.2019  
C(2019)5011 final

## PUBLIC VERSION

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 Where possible the information omitted has been replaced by ranges of figures or a general description.

### To the notifying party

**Subject: Case M.9205 – IBM / RED HAT  
Commission decision pursuant to Article 6(1)(b) of Council  
Regulation No 139/2004<sup>1</sup> and Article 57 of the Agreement on the  
European Economic Area<sup>2</sup>**

Dear Sir or Madam,

- (1) On 20 May 2019, the European Commission received notification of a proposed concentration pursuant to Article 4 of the Merger Regulation by which International Business Machines Corporation (“IBM” or “Notifying Party”, USA) intends to acquire sole control of Red Hat Inc. (“Red Hat”, USA) (the “Transaction”)<sup>3</sup>. IBM and Red Hat are collectively referred to as “Parties”.

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<sup>1</sup> 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.

<sup>2</sup> OJ L 1, 3.1.1994, p. 3 (the 'EEA Agreement').

<sup>3</sup> Publication in the Official Journal of the European Union No C 185, 29.05.2019, p. 21.

## **1. THE PARTIES**

- (2) **IBM** is a public company headquartered in Armonk, New York, USA. It is active worldwide in the development, production, and marketing of a wide variety of information technology (“IT”) solutions, namely enterprise IT software and systems (such as servers, storage systems, cloud, and cognitive offerings) and IT implementation services (such as business consulting and IT infrastructure services).
- (3) **Red Hat** is a public company headquartered in Raleigh, North Carolina, USA. It is a global provider of open-source software and support services, using a community-powered approach to develop and offer a wider range of open-source software solutions for enterprise customers, including in hybrid cloud environments.

## **2. THE TRANSACTION**

- (4) Under an agreement and plan of merger dated 28 October 2018 (the “Agreement”), IBM will acquire all of Red Hat’s issued and outstanding common shares for a total value of approximately USD 34 billion. Therefore, the Transaction consists of the acquisition of sole control by IBM over Red Hat within the meaning of Article 3(1)(b) of the Merger Regulation.

## **3. EU DIMENSION**

- (5) The Parties concerned have a combined aggregate world-wide turnover of more than EUR 5 000 million<sup>4</sup> (IBM: EUR 67 392 million; Red Hat: EUR 2 531 million). Each of them has an EU-wide turnover in excess of EUR 250 million (IBM: EUR [...]; Red Hat: EUR [...]), but they do not achieve more than two-thirds of their aggregate EU-wide turnover within one and the same Member State. The notified operation therefore has an EU dimension.

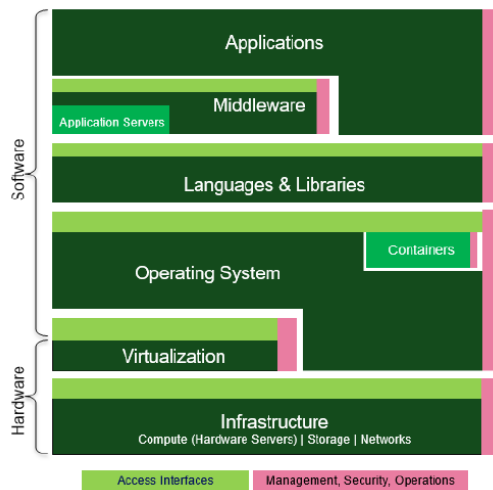
## **4. RELEVANT MARKETS**

### **4.1. Introduction – approach to market definition**

- (6) Red Hat and IBM are both active in IT software for enterprise customers across different layers of the IT stack.

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<sup>4</sup> Turnover calculated in accordance with Article 5 of the Merger Regulation.



- (7) The Parties' activities overlap in a number of plausible markets or market segments at nearly all levels of the IT software stack. The Transaction also creates a large number of non-horizontal relationships.
- (8) In determining the relevant markets, where possible, the Notifying Party provided its views on the product and geographic market definitions on the basis of previous Commission decisions. The Notifying Party also relies on the segmentation of the market intelligence companies IDC and/or Gartner,<sup>5</sup> which the Notifying Party submits has been used in previous Commission decisions, in order to identify the narrowest possible product markets on which the Parties are active.
- (9) For the purpose of the present decision, the Commission carried out its competitive assessment on the basis of the narrowest possible product market segments identified by the Notifying Party in accordance with IDC and Gartner segmentations for which market share data is available and which were affected on the basis of 2018 market shares data.<sup>6</sup>
- (10) In the following Sections, the Commission carries out an assessment on the basis of IDC's primary markets for (i) Application Development and Deployment Software (Section 4.2) and (ii) System Infrastructure Software (Section 4.3).
- (11) IDC sub-segments the primary market for Application Development and Deployment Software into the secondary markets for (i) Application Platform Software,<sup>7</sup> (ii) Integration and Orchestration,<sup>8</sup> (iii) Application Development,<sup>9</sup> (iv) Data Management.<sup>10</sup>

<sup>5</sup> IDC and Gartner classifications are not directly comparable with each other. This decision refers to the segments as indicated by the Notifying Party in the Form CO.

<sup>6</sup> In the present decision, the Commission only refers to market segments which are horizontally or non-horizontally affected based on 2018 market shares data. On that basis, the following possible segments are not discussed in this decision: (i) Storage Resource Management, (ii) ITOM Mainframe Tools, (iii) Performance Analysis: Artificial Intelligence for Operations, IT Infrastructure Monitoring and Other Monitoring Tools.

<sup>7</sup> Within the secondary market for Application Platform Software, IDC identifies the functional markets for (i) Deployment-Centric Application Platforms (Section 4.2.1) and (ii) Transaction Processing Monitors (Section 4.2.2).

- (12) IDC sub-segments the primary market for System Infrastructure Software into the secondary markets for (i) Storage,<sup>11</sup> (ii) Physical and Virtual Computing Software,<sup>12</sup> (iii) Network<sup>13</sup> and (iv) Operating Systems<sup>14</sup>.
- (13) When relevant, the Commission also relied on the Gartner segmentation.<sup>15</sup>

#### **4.2. Application Development and Deployment Software (Middleware)**

- (14) Middleware is a large and diverse category of software that is used for building and operating large enterprise software applications. Some middleware is provided as prebuilt libraries or components that developers incorporate into applications and components. Middleware simplifies and accelerates development by reducing the need to recreate common functionality required by many applications. Middleware includes several products that could constitute sub-segments such as deployment-centric application platforms, business process management suites, integration software, event-driven middleware, business rules management systems, transaction processing monitors, managed file transfer software, non-relational database management systems, etc.
- (15) In *Oracle/Sun Microsystems*<sup>16</sup>, *Oracle/BEA*<sup>17</sup>, and *IBM/ILOG*<sup>18</sup> the Commission considered whether all types of middleware belong to a single product market or whether it would be necessary to further sub-segment the possible market according to the end use of the product, but ultimately left the precise product market definition open in *Oracle/Sun Microsystems and Oracle/BEA*. In those decisions, the Commission also relied on IDC and Gartner segmentation in order to identify the possible affected markets.

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<sup>8</sup> Within the secondary market for Integration and Orchestration, IDC identifies the functional markets for (i) Integration Software and a sub-market for API Management (Section 4.2.4), (ii) Event-Driven Middleware (Section 4.2.5), and (iii) Managed File Transfer (Section 4.2.6).

<sup>9</sup> Within the secondary market for Application Development, IDC identifies the functional market for Business Rules Management Systems (Section 4.2.7).

<sup>10</sup> Within the secondary market for Data Management, IDC identifies the functional markets for Non-Relational Database Management (Section 4.2.8).

<sup>11</sup> Within the secondary market for Storage, IDC identifies the functional market for Software-Defined Storage Controller (Section 4.3.1).

<sup>12</sup> Within the secondary market for Physical and Virtual Computing Software, IDC identifies the functional market for Software-Defined Storage Compute and the sub-market for Container Infrastructure Software (Section 4.3.2).

<sup>13</sup> Within the secondary market for Network, IDC identifies the functional markets for (i) Network Management Software (Section 4.3.3).

<sup>14</sup> Within the secondary market for Operating Systems, IDC identifies the functional markets for (i) Server Operating Systems (paid and unpaid) and (ii) Server Operating Systems (paid only) (Section 4.3.10).

<sup>15</sup> Gartner identifies the following macromarkets which are referred to in this decision: (i) Storage Management and its sub-segment Storage Management Mainframe Software (Section 4.3.4); (ii) Security and its sub-segments Security Information and Events Management (Section 4.3.5), Security Testing (Section 4.3.6), Web Access Management (Section 4.3.7); (iii) IT Operations and its sub-segment Other ITOM (Section 4.3.8); (iv) Application Development and its sub-segment AD Mainframe Tools (Section 4.3.9). These Gartner macromarkets would broadly fall within IDC's primary market for System Infrastructure Software.

<sup>16</sup> Commission decision of 30 July 2009 in case M.5529 *Oracle/Sun Microsystems*, recitals 763-765.

<sup>17</sup> Commission decision of 26 March 2008 in case M.5080 *Oracle/BEA*, paragraphs 9-12.

<sup>18</sup> Commission decision of 6 October 2008 in case M.5317 *IBM/ILOG*, paragraph 20.

- (16) In *Oracle/Sun*, the Commission concluded that the relevant geographic market for middleware is worldwide.

#### **4.2.1. Deployment-Centric Application Platforms**

- (17) Deployment-centric application platforms (“DCAPs”) host applications and provide them with common services that allow the application to operate effectively. DCAPs include application server software platforms (referred to as “application servers” or “app servers”) that provide a common framework for applications to provide services that would need to be duplicated across multiple applications, manage the application runtime environment consistently and at scale, and implement complex functions (e.g. the management of database connections) with high quality and resiliency.<sup>19</sup>
- (18) The Parties’ products are: (i) IBM’s WebSphere Application Server (“WAS”)<sup>20</sup> and (ii) Red Hat’s JBoss Enterprise Application Platform (“JBoss”), and JBoss Web Server. Both IBM’s WAS and Red Hat’s JBoss products are Java Enterprise Edition (“Java EE”) compliant products. Java EE extends Java to include a defined list of capabilities that have proven valuable across enterprise applications. These capabilities are typically called Java EE Web Profile and Java EE Full Profile.<sup>21</sup>
- (19) Traditional application servers are “heavyweight” and are designed to support large monolithic application architecture. Legacy applications are typically written as monoliths (i.e. all features of the application are contained within that application).
- (20) Applications are increasingly built on the principles of integrating many small and dispersed components (a microservices architecture) instead of having to integrate each new application into an existing, large monolithic architecture. These principles allow application components to evolve independently and rapidly, to scale when workloads are unpredictable, and to be reused in a predictable manner. DCAPs supporting these applications have different requirements compared to traditional middleware: they must be lightweight for rapid delivery and startup, use different mechanisms to ensure resilience, focus on integration of dispersed applications rather than on heavy application servers, and address different security risks.
- (21) To capture the distinction between architectural needs that process large amounts of data or perform complex processes across multiple systems, IT systems are

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<sup>19</sup> Form CO, paragraphs 314-316.

<sup>20</sup> There are currently three main editions of WAS, with each edition providing progressively greater functionality: (i) WAS Liberty Core; (ii) WAS (Base), (iii) WAS ND. WAS (Base) and WAS ND are suited to customers with legacy, on-premises workloads. WAS Liberty Core—which includes only the features of Java EE required by web applications—is offered to customers with purely cloud-based workloads (where a minimal resource footprint is crucial) and for applications that do not require clustering or the same degree of functionality as those supported by traditional WAS.

<sup>21</sup> Java EE Web Profile includes security, connections to web services, and transaction integrity, among other things; Java EE Full Platform includes all of Java EE Web Profile and adds features e.g. Java batch (for data processing), JavaMail (for sending and receiving email), and Java Message Queues (for enabling communication between components of a distributed application).

sometimes placed in the two following categories: (i) system of record and (ii) system of engagement.

- Systems of record are IT systems that focus on managing vast quantities of data. These systems typically interact with databases and manage high volumes of transactions. They have capabilities (also referred to as “back-end capabilities”) focusing on the storing and processing of information.<sup>22</sup>
- System of engagement: systems of engagement are IT systems that focus on interacting with users. Systems of engagement are typically immediate, open, and accessible ad hoc—e.g. software delivered through the cloud and on mobile devices. They have capabilities that focus on interfaces engaging with users (also referred to as “front-end capabilities”), which typically do not require the same degree of data and transactional integrity as systems of record.<sup>23</sup>

(22) On that basis, the Notifying Party has identified three use cases which DCAPs can support: (i) back-end workloads which require extensive capabilities (such as high availability and cluster management, legacy integration, performance and optimization, standards support), (ii) back-end workloads which do not require these capabilities and (iii) front-end workloads.

#### **4.2.1.1. Commission precedents**

- (23) In *Oracle/Sun*<sup>24</sup> and *Oracle/BEA*<sup>25</sup>, the Commission considered a possible relevant product market for all application servers without further segmenting according to programming language, operating system compatibility, or proprietary/open source, although it ultimately left the product market definition open.
- (24) In *Oracle/Sun*<sup>26</sup>, the Commission concluded that the relevant geographic market for middleware and sub-segments thereof is worldwide.

#### **4.2.1.2. Notifying Party’s views**

(25) The Notifying Party submits that the relevant product market for DCAPs should encompass all platforms (i.e. application server software platforms as well as deployment-orientated platforms operating in public and private clouds) that host applications, provide them with common services that would otherwise need to be

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<sup>22</sup> Mainframes or other larger servers, coupled with databases like Oracle or Db2, application servers like WebLogic, WAS, or transaction processing monitors like CICS, are typically systems of record. They are used, for example, to constantly and accurately process payments and reservations against databases with minimized risk of error or failure.

<sup>23</sup> Social media (e.g. Facebook), online collaboration (e.g. Google Docs), and messaging applications (e.g. WhatsApp) are examples of systems of engagement.

<sup>24</sup> Commission decision of 30 July 2009 in case M.5529 *Oracle/Sun Microsystems*, recitals 761-765.

<sup>25</sup> Commission decision of 26 March 2008 in case M.5080 *Oracle/BEA*, paragraphs 9-12 and paragraph 34

<sup>26</sup> Commission decision of 30 July 2009 in case M.5529 *Oracle/Sun Microsystems*, paragraphs 776-769.

duplicated across multiple applications, and manage the application runtime environment consistently and at scale.<sup>27</sup>

- (26) The Notifying Party argues that DCAPs running monolithic applications and DCAPs running cloud-native microservices belong to the same product market. According to the Notifying Party, there is a continuum of DCAPs spanning from those suitable for heavyweight workloads requiring sophisticated back-end DCAP capabilities in addition to those offered by the Java EE specification to those best-suited for cloud-native applications and front-end workloads, depending on the functionalities of each DCAP. It is therefore difficult to establish clear-cut categories in which to fit each DCAP.<sup>28</sup>
- (27) Furthermore, in the Notifying Party's view, DCAPs vendors have no way of discriminating between customers according to use case, since they have no visibility over how their DCAPs are ultimately used. Therefore, the Notifying Party submits that pursuant to the Market Definition Notice,<sup>29</sup> there are no grounds on which to define a separate product market for DCAPs running monolithic or microservices workloads, as the overlap between these two (hypothetical) groups of customers is necessarily fluid.<sup>30</sup>
- (28) The Notifying Party submits that, in line with the Commission decisions listed at paragraphs (23) and (24), the relevant geographic market for DCAPs is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>31</sup>

#### **4.2.1.3. Commission's assessment**

- (29) The Commission considers that the possible market for DCAPs does not need to be further sub-segmented based on programming language, operating system compatibility or use cases / types of applications (e.g. monolithic applications, applications built as a system of microservices) for the following reasons.
- (30) First, the results of the market investigation indicated that further segmentation by use cases to which DCAPs can cater is not warranted. A competitor expressed the view that customers do not distinguish between back-end workloads and front-end workloads but "*in general customers are looking for an application server platform that supports the Java EE APIs and that is generally applicable to the wide range of workloads found typically in a large organisation*".<sup>32</sup> Another competitor explained that customers are primarily interested in the outcome based on their application needs and "*the technical requirements can be met with many application server and architectural options*".<sup>33</sup> Customers responding to the

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<sup>27</sup> See Form CO, paragraph 331.

<sup>28</sup> See Form CO, paragraph 332.

<sup>29</sup> Commission Notice on the definition of relevant market for the purposes of Community competition law [1997] OJ C372/5, paragraph 43.

<sup>30</sup> See Form CO, paragraph 332.

<sup>31</sup> See Form CO, paragraph 337.

<sup>32</sup> See replies to Questionnaire Q1 to competitors, question 14.1.

<sup>33</sup> See replies to Questionnaire Q1 to competitors, question 15.1.



market investigation confirm that their DCAPs choice depends on the features required by the various applications and technology decisions.<sup>34</sup>

- (31) Therefore, the Commission considers that, from the demand side, customers employ different types of DCAPs which cover a range of use cases and functionalities.
- (32) From the supply side, competitors indicated that DCAPs can support a range of different use cases, without making a clear-cut distinction between their functionalities and suitability for specific use cases.<sup>35</sup> These DCAPs include Java EE, other platforms/programming languages, cloud-native application platforms offered by CSPs, serverless programming etc.<sup>36</sup>
- (33) Furthermore, with the emergence of new technologies such as Container Infrastructure Software (see Section 4.3.2), any distinction between use cases (back-end and front-end) becomes even more blurred. A competitor explained that *“the more modern approach to this class of problems (“how do I run this application”) is to use containers, which wrap up the language together with the application into a container. In that world, the distinctions of front and back end, and compatibility with legacy apps, are very different”*<sup>37</sup>.
- (34) In addition, the market investigation results did not suggest that DCAPs vendors can discriminate between customers using DCAPs for different use cases.<sup>38</sup>
- (35) Second, a majority of customers consider that they can switch their traditional (legacy and heavy-weight) application server either to other heavy-weight application servers or to applications built as a system of microservices.<sup>39</sup> Customers responding to the market investigation switched away from WAS to other Java EE DCAPs (e.g. JBoss, Weblogic, Tomcat, Jetty, Pivotal tc Server etc.), or to other platforms e.g. Springboot or .NET. A number of customers indicated that they switched to JBoss mainly due to cost considerations (some mention in addition that they moved to more light-weight options). Even if customers acknowledge that switching entails time, substantial costs and engineering efforts, a large number of customers which responded to the market investigation have migrated at least some existing applications. A small number of customers explained that switching is only likely to happen as part of a wider IT architecture transformations.<sup>40</sup>
- (36) In light of the above, the Commission considers that the possible market for DCAPs does not need to be further sub-segmented based on programming language, operating system compatibility or use cases / types of applications (e.g. monolithic applications, applications built as a system of microservices). However, as regards free and unsupported open source DCAPs, the Commission considers that demand-side substitution is most likely too limited to exercise a

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<sup>34</sup> See replies to Questionnaire Q2 to customers, question 5.

<sup>35</sup> See replies to Questionnaire Q1 to competitors, questions 7, 8, 9, 10, 11, 12.

<sup>36</sup> *Ibid.*

<sup>37</sup> See replies to Questionnaire Q1 to competitors, question 14.1.

<sup>38</sup> See replies to Questionnaire Q1 to competitors, question 14.

<sup>39</sup> See replies to Questionnaire Q1 to customers, question 10.

<sup>40</sup> See replies to Questionnaire Q1 to customers, question 10.

competitive constraint on DCAPs with commercial support or proprietary DCAPs for the following reasons.

- (37) First, customers responding to the market investigation consider free and unsupported open source DCAPs as credible alternatives to proprietary or supported open-source DCAPs only for low-risk use cases.<sup>41</sup> A small number of customers explained that for low-risk use cases, they can self-support open-source software, which requires developing in-house capabilities and relying on the open source community for updates, bug fixes etc. According to some customers, this is an expensive option as compared to procuring commercial support.
- (38) Second, for mission-critical applications the majority of customers using open source DCAPs procure commercial support (directly from the vendor or from third parties specialised in providing commercial support for open source software).<sup>42</sup> A number of customers explained that internal companies' policies and IT strategies would not allow the use of unsupported DCAPs.<sup>43</sup>
- (39) Therefore, the Commission does not consider that free and unsupported open source DCAPs belong to the same product market as proprietary or commercially supported DCAPs.
- (40) The Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under any plausible product market definition.
- (41) In line with the Commission decisions listed at paragraph (23), the Commission considers that the relevant geographic market for DCAPs is global. Nevertheless, for completeness, the Commission carried out the competitive assessment in Section 5.2.2 also at the EEA-wide level.

#### **4.2.2. Transaction Processing Monitors**

- (42) A Transaction Processing Monitor ("TPM") is a control program that ensures transactions are completed successfully. It primarily handles resource sharing (also referred to as load balancing), as well as ensures optimal use of resources by applications.
- (43) IBM offers the following TPM products: (i) IBM CICS is IBM's main TPM product<sup>44</sup>, (ii) IBM TXSeries, (iii) IBM z/OS Connect Enterprise Edition, (iv) IBM z/Transaction Processing Facility, (v) IMS Transaction Manager/Database Manager. Red Hat is not active in TPMs.

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<sup>41</sup> See replies to Questionnaire Q2 to customers, question 15.

<sup>42</sup> See replies to Questionnaire Q2 to customers, question 16.

<sup>43</sup> See replies to Questionnaire Q2 to customers, question 17.1.

<sup>44</sup> It is a set of enterprise application servers with transactional performance and connectivity for mission-critical transactions.

#### **4.2.2.1. Commission precedents**

- (44) In *Dell/EMC*<sup>45</sup> and *Oracle/BEA*<sup>46</sup>, it referred to TPMs as a possible sub-segment of the overall middleware market. In *Oracle/Sun*<sup>47</sup>, the Commission identified TPMs as a product within application server middleware, in accordance with IDC's classification although it ultimately left the market definition open.
- (45) In *Oracle/Sun*<sup>48</sup>, the Commission concluded that the relevant geographic market for middleware and sub-segments thereof is worldwide.

#### **4.2.2.2. Notifying Party's views**

- (46) The Notifying Party submits that, in accordance with IDC's taxonomy, TPMs could be viewed as a separate relevant product market. The IDC taxonomy identifies a functional market TPMs, within the secondary market Application Platforms and the primary market Application Development and Deployment Software. IDC does not segment this functional market further.<sup>49</sup>
- (47) In the Notifying Party's view, TPMs have a distinct functionality within enterprise middleware as they mediate and optimize the use of resources (e.g. databases) by applications, balance load of dynamic processes, and monitor and fix processes between the applications and the databases.<sup>50</sup> According to the Notifying Party, the Transaction does not raise any concerns on any of the possible segmentations, and the precise product market definition can be left open.<sup>51</sup>
- (48) The Notifying Party submits that, in line with the Commission decisions listed at paragraphs (44)-(45), the relevant geographic market for TPMs is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>52</sup>

#### **4.2.2.3. Commission's assessment**

- (49) In line with *Dell/EMC*, *Oracle/BEA* and *Oracle/Sun*, a possible product market for TPMs can be identified. Nevertheless, the Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest possible product market definition identified by IDC for which market shares data is available.
- (50) In line with the Commission decisions listed at paragraphs (44)-(45), the Commission considers that the relevant geographic market for TPMs is global.

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<sup>45</sup> Commission decision of 25 January 2016 in case M.7861 *Dell/EMC*, paragraph 55.

<sup>46</sup> Commission decision of 26 March 2008 in case M.5080 *Oracle/BEA*, paragraph 8.

<sup>47</sup> Commission decision of 30 July 2009 in case M.5529 *Oracle/Sun Microsystems*, recital 777.

<sup>48</sup> Commission decision of 30 July 2009 in case M.5529 *Oracle/Sun Microsystems*, recitals 776-769.

<sup>49</sup> See Form CO, paragraph 730.

<sup>50</sup> According to the Notifying Party, TPMs are typically defined by most market analysts (including IDC and Gartner) as mainframe-based legacy application runtime environments that focus primarily on supporting "pre-web" era programming languages (such as COBOL, C, C++, PL/I, and Assembler).

<sup>51</sup> See Form CO, paragraphs 729-733.

<sup>52</sup> See Form CO, paragraph 734.

Nevertheless, for completeness, the Commission carried out the competitive assessment in Section 5.3.7.3 also at the EEA-wide level.

#### **4.2.3. Business Process Management Suites**

- (51) Business process management (“BPM”) Suites provide intuitive, point-and-click environments for non-programmers to model business processes and develop and run simple, process-driven applications based on these models.
- (52) In the BPM Suite segment, IBM offers IBM Business Process Manager (“IBM BPM”), including three versions – i.e. BPM Express, BPM, and BPM on Cloud. Red Hat offers Red Hat Process Automation Manager (formerly Red Hat JBoss BPM Suite).

##### **4.2.3.1. Commission precedents**

- (53) In *IBM/ILOG*<sup>53</sup> and *Oracle/Sun*<sup>54</sup> the Commission identified a possible relevant market for “process automation middleware” (which corresponds to model-driven application platforms today).<sup>55</sup> The Commission adopted this segment as the relevant market in *IBM/ILOG*, but left the product market definition open in *Oracle/Sun*.
- (54) In *Oracle/Sun*<sup>56</sup>, the Commission concluded that the relevant geographic market for middleware and sub-segments thereof is worldwide.

##### **4.2.3.2. Notifying Party's views**

- (55) The Notifying Party refers to the Commission decisions listed at paragraph (53) and to Gartner's segment for BMP Suites.
- (56) The Notifying Party submits that the term “process automation middleware”, as used in the *IBM/ILOG* and *Oracle/Sun Microsystems* decisions, refers to a former IDC segment that has not been included in the IDC Worldwide Software Taxonomy since 2013. The closest segment in IDC’s 2018 taxonomy is the “Model-Driven Application Platforms” (“MDAP”) functional market, which however includes both process-centric and data-centric platforms. As the Parties’ products are both process-centric platforms, and as data-centric platforms typically offer a more limited range of functionality for the design, modelling, and optimization of business processes than process-centric platforms, the Notifying Party submits that the Gartner segment Business Process Management Suites may be an appropriate representation of the relevant product market on a conservative basis.

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<sup>53</sup> Commission decision of 6 October 2008 in case M.5317 *IBM/ILOG*, paragraphs 19-20.

<sup>54</sup> Commission decision of 30 July 2009, Case M.5529 *Oracle/Sun Microsystems*, recitals 760-765.

<sup>55</sup> Gartner’s taxonomy identifies a subsegment for Business Process Management Suites, which is part of the Application Infrastructure and Middleware macromarket. It corresponds to but is narrower than IDC’s functional market for Model-Driven Application Platforms within the secondary market for Application Platforms.

<sup>56</sup> Commission decision of 30 July 2009 in case M.5529 *Oracle/Sun Microsystems*, paragraphs 776-769.

- (57) According to the Notifying Party, the Transaction does not raise any concerns on any of the possible segmentations, and the precise product market definition can be left open.<sup>57</sup>
- (58) The Notifying Party submits that, in line with the Commission decisions listed at paragraph (54), the relevant geographic market for BPM Suites is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>58</sup>

#### **4.2.3.3. Commission's assessment**

- (59) In line with *IBM/ILOG* and *Oracle/Sun*, the possible product market for BMP Suites can be identified. Nevertheless, the Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest product market definition identified by Gartner for which market shares data is available and which leads to the highest combined market shares of the Parties.
- (60) In line with the Commission decisions listed at paragraph (54), the Commission considers that the relevant geographic market for BMP Suites is global. Nevertheless, for completeness, the Commission carried out the competitive assessment in Section 5.2.3 also at the EEA-wide level.

#### **4.2.4. Integration Software**

- (61) Integration Software is server software used to connect two or more separate applications, to coordinate requests from an application's front end and back-end services, and to connect applications to databases. The Parties' activities overlap in Integration Software overall, as well as in two types of Integration Software: API management software<sup>59</sup> and integration platforms<sup>60</sup>.
- (62) As regards API Management Software, IBM offers IBM API Connect, whereas Red Hat offers 3scale API Management. As regards integration platforms, IBM offers IBM App Connect and Red Hat offers Fuse and Fuse Online.

##### **4.2.4.1. Commission precedents**

- (63) In *Oracle/BEA*<sup>61</sup>, the Commission identified application integration software as a possible relevant market, although it ultimately left the market definition open.
- (64) In *Oracle/Sun*, the Commission concluded that the relevant geographic market for application integration software is worldwide.<sup>62</sup> Similarly, in *Oracle/Sun*, the

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<sup>57</sup> See Form CO, paragraphs 421-422.

<sup>58</sup> See Form CO, paragraph 427.

<sup>59</sup> APIs may be used by companies to deliver their data and services to customers. In this context, enterprises release public APIs that enable other applications to incorporate their services or have access to their data.

<sup>60</sup> Integration platforms connect different applications, systems, and data in a single platform.

<sup>61</sup> Commission decision of 26 March 2008 in case M.5080 *Oracle/BEA*, paragraph 12.

<sup>62</sup> Commission decision of 30 July 2009 in case M.5529 *Oracle/Sun Microsystems*, recital 15.

Commission concluded that the relevant geographic market for middleware and sub-segments thereof is worldwide.<sup>63</sup>

#### **4.2.4.2. Notifying Party's views**

- (65) The Notifying Party refers to IDC's segment for Integration Software which is further sub-segmented into (i) API Management Software, (ii) Integration Platforms, and (iii) Connectivity Adapters And Plug-in Software. The Notifying Party submits that the relevant product market should encompass all Integration Software products without distinguishing between the three categories of products. In the Notifying Party's view, all these products perform the same function of enabling communication and the exchange of services and data between applications in real time.<sup>64</sup> Nevertheless, the Notifying Party provided market shares data both for Integration Software and the narrowest possible sub-segments as per IDC where both Parties are active, i.e. (i) API Management Software and (ii) Integration Platforms.<sup>65</sup> Only the overall Integration Software segment and its API Management Software sub-segment are affected.
- (66) The Notifying Party submits that, in line with the Commission decisions listed at paragraphs (63)-(64), the relevant geographic market for Integration Software (and any possible sub-segment thereof) is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>66</sup>

#### **4.2.4.3. Commission's assessment**

- (67) In line with *Oracle/BEA* and IDC segmentation, the possible product market for Integration Software and its sub-segment for API Management Software can be identified. Nevertheless, the Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest possible product market definition identified by IDC for which market shares data is available and which leads to the highest combined market shares of the Parties.
- (68) In line with the Commission decisions listed at paragraphs (63)-(64), the Commission considers that the relevant geographic market for Integration Software (and any possible sub-segment thereof) is global. Nevertheless, for completeness, the Commission carried out the competitive assessment in Section 5.2.4 also at the EEA-wide level.

#### **4.2.5. Event-Driven Middleware**

- (69) Event-Driven Middleware is software that enables program-to-program (or component-to-component) communication—i.e. it facilitates the transfer of

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<sup>63</sup> Commission decision of 30 July 2009 in case M.5529 *Oracle/Sun Microsystems*, recital 769.

<sup>64</sup> According to the Notifying Party, Integration platforms typically incorporate connectivity adaptors and plug-in software as a feature: these serve to translate data from one protocol or format to another. Integration platforms may also include API management functionality, such as the ability to build APIs and publish APIs to internal development teams and developer communities products that integrate disparate applications and information systems.

<sup>65</sup> See Form CO, paragraphs 477-482.

<sup>66</sup> See Form CO, paragraph 483.

information between disparate applications and components across multiple hardware and software platforms that would not otherwise be able to communicate.

- (70) IBM offers the following products that fall into Event-Driven Middleware: IBM MQ, IBM Event Streams, and Cloud Functions. Red Hat offers Red Hat AMQ (including Red Hat AMQ Streams).

#### **4.2.5.1. Commission precedents**

- (71) There is no Commission precedent with regard to Even-Driven Middleware.
- (72) In *Oracle/Sun*<sup>67</sup>, the Commission concluded that the relevant geographic market for middleware and sub-segments thereof is worldwide.

#### **4.2.5.2. Notifying Party's views**

- (73) The Notifying Party refers to IDC's segment for Event-Driven Middleware which is further sub-segmented into (i) Message-Oriented Middleware, (ii) Streaming Analytics Software, and (iii) Functions Software.<sup>68</sup> IDC does not provide market shares for these sub-segments.
- (74) The Notifying Party submits that the relevant product market should encompass all Event-Driven Middleware without distinguishing between the three categories of products. In the Notifying Party's view, all these products perform the same function: monitoring and detecting events and transmitting the events to relevant applications and systems to execute a response.
- (75) According to the Notifying Party, while certain software are more adapted to the transmission of structured messages rather than real-time events, other software combine both capabilities in one product. For example, Red Hat AMQ is equipped to handle traditional messages (including through a centralized message hub) and to carry out real-time event streaming based on Apache Kafka technology. The Notifying Party explains that while certain software may focus on the transmission of events rather than their processing and analysis, other products incorporate all these functions. For example, AWS Kinesis provides customers with the ability to capture continuous real-time data (such as video streams from security cameras), and to process and analyze these volumes of data (for example, to solve traffic problems, prevent crime, or dispatch emergency responders).<sup>69</sup>
- (76) The Notifying Party argues that there is also significant substitution of supply, as the main providers of Event-Driven Middleware have all developed offerings suitable for transmitting traditional messages and/or real-time events and products with processing and analytics capabilities.

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<sup>67</sup> Commission decision of 30 July 2009 in case M.5529 *Oracle/Sun Microsystems*, recital 769.

<sup>68</sup> The Notifying Party submits that the IDC segmentation should be preferred to Gartner segmentation as Gartner's "Message-Oriented Middleware" corresponds to IDC's overall "Event-Driven Middleware", without accounting for streaming analytics.

<sup>69</sup> See Form CO, paragraphs 500-503.

- (77) The Notifying Party submits that, in line with the Commission decision listed at paragraph (72), the relevant geographic market for Event-Driven Middleware is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>70</sup>

#### **4.2.5.3. Commission's assessment**

- (78) The Commission considers that in line with IDC's segmentation, a possible product market for Event-Driven Middleware can be identified. Based on the Notifying Party's submission, there are many offerings which can support and combine capabilities for messaging, streaming analytics and functions software. Therefore, the Commission does not consider that it would be justified to further sub-segment the possible market for Event-Driven Middleware.
- (79) Nevertheless, the Commission considers that for the purpose of the present decision the product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market regardless of whether there is an overall market for Event-Driven Middleware or whether there are separate markets for different types of Event-Driven Middleware.
- (80) In line with the Commission decisions listed at paragraph (72), the Commission considers that the relevant geographic market for Event-Driven Middleware is global. Nevertheless, for completeness, the Commission carried out the competitive assessment in Section 5.2.5 also at the EEA-wide level.

#### **4.2.6. Managed File Transfer Software**

- (81) Managed File Transfer Software enables enterprises to transfer files securely and at high speeds over a network, such as the Internet. Managed File Transfer software typically offers a higher-level of security and/or convenience compared to other file transfer options, such as e-mail or external storage devices. They may include additional features such as reporting (i.e. notification of successful file transfers), automation of file transfer-related activities and auditability.
- (82) IBM offers the following solutions: IBM Connect:Direct, IBM Aspera, IBM File Gateway, IBM Supply Chain Business Network File Transfer Service, and IBM WebSphere MQ. Each offering provides specific capabilities or deployment models targeting a comprehensive range of use cases. Red Hat is not active in Managed File Transfer Software.

##### **4.2.6.1. Commission precedents**

- (83) There is no Commission precedent with regard to Managed File Transfer Software.
- (84) In *Oracle/Sun*<sup>71</sup>, the Commission concluded that the relevant geographic market for middleware and sub-segments thereof is worldwide.

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<sup>70</sup> See Form CO, paragraph 504.

<sup>71</sup> Commission decision of 30 July 2009 in case M.5529 *Oracle/Sun Microsystems*, recital 769.



#### **4.2.6.2. Notifying Party's views**

- (85) The Notifying Party submits that Managed File Transfer Software (in line with IDC's taxonomy) constitutes a separate relevant product market.<sup>72</sup> The IDC taxonomy identifies the functional market Managed File Transfer Software within the secondary market for Integration and Orchestration Software and the primary market Application Development and Deployment Software. IDC does not segment this functional market further.
- (86) The Notifying Party submits that, in line with the Commission decision listed at paragraph (84), the relevant geographic market for Managed File Transfer Software is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>73</sup>

#### **4.2.6.3. Commission's assessment**

- (87) The Commission considers that in line with IDC's segmentation, a possible product market for Managed File Transfer Software can be identified. Nevertheless, the Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest product market definition identified by IDC for which market shares data is available and which leads to the highest market shares of the Parties.
- (88) In line with the Commission decisions listed at paragraph (84), the Commission considers that the relevant geographic market for Managed File Transfer Software is global. Nevertheless, for completeness, the Commission carried out the competitive assessment in Section 5.3.7.3 also at the EEA-wide level.

#### **4.2.7. Business Rules Management Systems**

- (89) Business rules management systems ("BRMS") enable business managers to define business rules in a familiar language and manage them in a central repository. Business applications can then be programmed to draw on these rules. This eliminates the need to modify the source code of individual applications each time rules are implemented or updated.
- (90) IBM offers IBM Operational Decision Manager ("ODM") in this market segment, whereas Red Hat offers Red Hat Decision Manager (formerly Red Hat JBoss BRMS).

##### **4.2.7.1. Commission precedents**

- (91) In *IBM/ILOG*<sup>74</sup>, the Commission identified BRMS as a relevant market.
- (92) In *Oracle/Sun*, the Commission concluded that the relevant geographic market for middleware and sub-segments thereof is worldwide. Similarly, in *IBM/ILOG*, the

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<sup>72</sup> See Form CO, paragraphs 741-745.

<sup>73</sup> See Form CO, paragraph 746.

<sup>74</sup> Commission decision of 6 October 2008 in case M.5317 *IBM/ILOG*, paragraphs 17 and 20.

Commission concluded that the relevant geographic market for BRMS is worldwide.<sup>75</sup>

#### **4.2.7.2. Notifying Party's views**

- (93) The Notifying Party submits that relevant product market should be defined as the market for BRMS, as per IDC's taxonomy. In the Notifying Party's view, BRMS form a separate relevant product market to BPM Suites (see Section 4.2.3). The Notifying Party submits that BPM Suites and BRMS products are often sourced independently of each other, and there is robust demand for standalone BRMS software.<sup>76</sup>
- (94) The Notifying Party submits that, in line with the Commission decisions listed at paragraphs (91)-(92), the relevant geographic market for BRMS is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>77</sup>

#### **4.2.7.3. Commission's assessment**

- (95) In line with *IBM/ILOG*, the product market for BRMS can be identified. Nevertheless, the Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest possible product market definition for which market shares data is available and which leads to the highest combined market shares of the Parties.
- (96) In line with the Commission decisions listed at paragraphs (91)-(92), the Commission considers that the relevant geographic market for BRMS is global. Nevertheless, for completeness, the Commission carried out the competitive assessment in Section 5.2.6 also at the EEA-wide level.

#### **4.2.8. Non-Relational Database Management Systems**

- (97) According to the Notifying Party, most databases systems today are relational databases that store data in separate tables, instead of placing all data in one large table, and define relationships between these tables. Non-relational database management systems ("DBMS") refer to a residual category of database systems which do not use this system. Non-relational DBMS differ from relational DBMS in programming language and the structure used to organize the data.
- (98) IBM offers a non-relational database management system ("DBMS"), called Information Management System. Red Hat is not active in non-relational database management systems.

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<sup>75</sup> Commission decision of 6 October 2008 in case M.5317 *IBM/ILOG*, paragraph 23.

<sup>76</sup> According to the Notifying Party, this is evidenced by the fact that the IDC functional market for BRMS, which only encompasses standalone BRMS products, has an estimated size of approximately USD [...] for 2017. See Form CO, paragraphs 526-532.

<sup>77</sup> Form CO, paragraph 533.

#### 4.2.8.1. Commission precedents

- (99) In *IBM/Informix*<sup>78</sup>, the Commission considered the database market as a whole (without segmentation by relational and non-relational databases), and also considered possible segmentations by “legacy” and distributed environments, operative system and customer requirements, but ultimately left the product market definition open. In *Oracle/Sun* and *SAP/Sybase*<sup>79</sup>, the Commission segmented the database market between relational and non-relational databases. It also considered further sub-segmentation, but ultimately left the question open.<sup>80</sup>
- (100) In *Oracle/Sun*, *SAP/Sybase*, and *IBM/Informix*, the Commission concluded that the relevant geographic market for databases is global.

#### 4.2.8.2. Notifying Party's views

- (101) The Notifying Party refers to IDC’s segment for Non-Relational DBMS, which is sub-segmented into four sub-markets: (i) end-user, (ii) navigational, (iii) object-oriented, and (iv) multivalued database management systems. The Notifying Party submits that IDC’s segment for Non-Relational Database Management Software (“DBMS”) constitutes the relevant product market.<sup>81</sup> Nevertheless, the Notifying Party submitted market shares data for the narrowest possible market segmentation including IBM’s product: the Gartner subsegment Prerelational Era DBMS (see Section 5.3.7.3).
- (102) According to the Notifying Party, Non-relational DBMS differ from relational DBMS in programming language and the structure used to organize the data: Non-relational DBMS are not strictly based on the (standard) programming language SQL for data definition and access or on relational theory, i.e. an organization of data in different tables which are formally related to each other.
- (103) In the Notifying Party’s view, a large number of competitors are active in Non-Relational DBMS, including Microsoft’s NoSQL on Azure, InterSystems’ Caché, CA Technologies’ Datacomm, and Apple’s FoundationDB, each generating at least USD 100 million in annual worldwide revenues from sales of Non-Relational DBMS. In addition, there is a large range of popular and successful open source offerings, including MongoDB, Redis, Apache Cassandra, HBase, Couchbase and many more. The Notifying Party submits that customers consider these Non-Relational DBMS products substitutable for each other as they all support a multi-value format, in-database computing, intelligent interface services, and emerging data types suited for cloud environment, providing comparable level of support and interoperability.<sup>82</sup>
- (104) The Notifying Party submits that, in line with the Commission decisions listed at paragraphs (99)-(100), the relevant geographic market for Non-Relational DBMS

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<sup>78</sup> Commission decision of 19 June 2001 in case M.2460 *IBM/Informix*.

<sup>79</sup> Commission decision of 20 July 2010 in case M.5904 *SAP/Sybase*, paragraph 16.

<sup>80</sup> Commission decision of 30 July 2009 in case M.5529 *Oracle/Sun Microsystems*, recitals 27 and 109.

<sup>81</sup> See Form CO, paragraphs 753-755.

<sup>82</sup> See Form CO, paragraph 755.

is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>83</sup>

#### **4.2.8.3. Commission's assessment**

- (105) In line with *Oracle/Sun*, *SAP/Sybase*, and *IBM/Informix*, the product market for Non-Relational DBMS can be identified. The Commission considers that, for the purpose of the present decision it can be left open whether Non-Relational DBMS constitute a relevant product market and whether it needs to be further sub-segmented as the competitive assessment under Section 5.3.7.3 remains unchanged irrespective of the exact product market definition.
- (106) In line with the Commission decisions listed at paragraphs (99)-(100), the Commission considers that the relevant geographic market for Non-Relational DBMS is global. Nevertheless, for completeness, the Commission carried out the competitive assessment in Section 5.3.7.3 also at the EEA-wide level.

### **4.3. System Infrastructure Software**

#### **4.3.1. Software-Defined Storage Controller Software**

- (107) Software-Defined Storage (“SDS”) refers to computer software programs that have been developed to optimize available storage hardware resources by creating a virtualized layer on top of the underlying physical storage hardware and that operates independently of the hardware to enable the efficient management of data storage and the scaling of data capacity, without being reliant on the hardware itself.
- (108) IBM's offering in the Software-Defined Storage Controller space includes: IBM Spectrum Virtualize (for block storage), IBM Spectrum Accelerate (for block storage), IBM Spectrum Scale (for file storage), IBM Spectrum NAS (for file storage), IBM Cloud Object Storage (formerly Cleversafe) (for object storage). Red Hat offers two basic SDS products: (i) Red Hat Ceph Storage and (ii) Red Hat Gluster Storage, based on open source Ceph and Gluster, respectively. These two products form the basis for Red Hat's other offerings such as Red Hat Storage One, Red Hat Hyperconverged Infrastructure, and Red Hat OpenShift Container Storage.

##### **4.3.1.1. Commission precedents**

- (109) In *Dell/EMC*<sup>84</sup>, the Commission considered the segment of “storage and virtualization software” but ultimately left the precise product market definition open.
- (110) In *Symantec/Veritas*<sup>85</sup>, the Commission considered whether the broader market for storage software was worldwide or at least EEA-wide, but ultimately left the exact scope of the relevant geographic market open.

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<sup>83</sup> See Form CO, paragraph 756.

<sup>84</sup> Storage virtualization software is a type of SDS controller software. See Commission decision of 25 January 2016 in case M.7861 *Dell/EMC*, paragraphs 134, 139.

<sup>85</sup> Commission decision of 15 March 2005 in case M.3697 *Symantec/Veritas*.

#### **4.3.1.2. Notifying Party's views**

- (111) The Notifying Party refers to IDC's functional market for SDS Controller Software which is further sub-segmented into (i) Block-Based, (ii) File-Based, (iii) Object-Based, and (iv) Hyperconverged Software-Defined Storage Controller Software.
- (112) The Notifying Party submits that the relevant product market with regard to the Parties' activities in the storage level of the IT stack is storage software which encompasses all software that manages, stores and/or ensures the accessibility, availability, and performance of information stored on physical storage media. As the Parties' activities do not give rise to a horizontally affected market on the overall market for Storage Software, the Notifying Party refers to the narrower possible market for SDS Controller Software.<sup>86</sup>
- (113) According to the Notifying Party, under IDC's taxonomy, SDS Controller Software includes and combines block, file, object, and hyperconverged software offerings that enable the creation of a storage system. Most SDS offerings support at least one of the three main types of storage methods: file, block and object storage.<sup>87</sup>
- (114) With regard to SDS Controller Software, according to the Notifying Party, the various types of SDS Controller Software are substitutable from a supply perspective. A number of vendors are active with SDS offerings for multiple storage formats. For example, Dell EMC, Hitachi, NetApp, SUSE and Nexenta all offer SDS products for more than one type of storage.<sup>88</sup>
- (115) The Notifying Party submits that, in line with the Commission decisions listed at paragraphs (109)-(110), the relevant geographic market for SDS Controller Software is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>89</sup>

#### **4.3.1.3. Commission's assessment**

- (116) The Commission considers that in line with *Dell/EMC*, a possible product market for SDS Controller Software can be identified. Based on the Notifying Party's submission, there are a number of SDS Controller Software which support multiple types of storage.
- (117) Nevertheless, for the purpose of the present decision the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market regardless of whether there is an overall market for SDS Controller Software or whether there are separate markets depending on the type of storage (Block-Based, File-Based, Object-Based, and Hyperconverged Software-Defined Storage Controller Software).

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<sup>86</sup> See Form CO, paragraph 563.

<sup>87</sup> See Form CO, paragraphs 554-556.

<sup>88</sup> See Form CO, paragraph 560.

<sup>89</sup> See Form CO, paragraph 564.

(118) In line with the Commission decisions listed at paragraphs (109)-(110), the Commission considers that the relevant geographic market for SDS Storage Controller Software is at least EEA-wide if not global. For the purpose of the present decision, the exact geographic market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under any plausible geographic market definition.

#### **4.3.2. Container Infrastructure Software**

(119) Containers are small, isolated, lightweight virtual workspaces that sit on an operating system and are used to build, host, and deploy an application. Their small footprint compared to other virtual workspaces (like virtual machines) makes containers easily portable between different systems and well-suited to deployment across multiple clouds. Container Infrastructure Software (or “container platforms”) comprises container engines, which instantiate containers, and orchestration software, which facilitate the management of containers and automate tasks such as deployment, workload balancing between containers, and the movement of containers between hosts.

(120) IBM provides Container Infrastructure Software in two products: (i) IBM Cloud Private (“ICP”) and (ii) IBM Cloud Kubernetes Service (i.e. IBM’s public cloud managed Kubernetes service).

(121) ICP is a platform for developing and managing containerised applications. It is an integrated environment for managing containers that includes the container orchestrator (Kubernetes<sup>90</sup>), a private image repository, a management console, and monitoring frameworks. According to the Notifying Party, ICP is focused on [...]: it consists of a private cloud that offers open source container platforms focused on using containers to achieve enhanced operational efficiency (targeting [...]) and enable new [...] technologies.<sup>91</sup>

(122) Red Hat offers several container infrastructure software products as part of the OpenShift family of products.<sup>92</sup> Red Hat OpenShift Container Platform (formerly known as OpenShift Enterprise) provides a platform for deploying both new and existing applications on secure, scalable resources with minimal configuration and management overhead. Enterprises run OpenShift on a wide variety of infrastructure, including public cloud environments, private cloud infrastructure, virtualization software, as well as bare-metal servers or a combination of all or some of the above.

(123) Red Hat OpenShift Container Platform should be distinguished from Red Hat OpenShift Container Engine—both are forms of the paid-for OpenShift product offered by Red Hat, but Red Hat OpenShift Container Engine consists simply of the RHEL or Core OS operating system, a container engine, and Red Hat’s Kubernetes orchestrator, while Red Hat OpenShift Container Platform also

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<sup>90</sup> An open source container management system, based on Google-developed technology.

<sup>91</sup> According to the Notifying Party, ICP can be used on customers’ servers and infrastructure of choice and with their hosting partner of choice. IBM currently supports ICP on bare metal servers, VMware, OpenStack, OpenShift, Amazon Web Services, Microsoft Azure, and IBM Cloud. IBM Cloud Private customers can therefore use IBM Cloud Private with a variety of third-party cloud providers.

<sup>92</sup> Red Hat OpenShift Online, Red Hat OpenShift Dedicated, Red Hat OpenShift Application Runtimes, Red Hat Container Development Kit (formerly OpenShift Developer Studio).

includes advanced management capabilities and more detailed development functionality.

#### **4.3.2.1. Commission precedents**

(124) In *Dell/EMC*<sup>93</sup>, the Commission considered container technology and virtual machine-based virtualization software as distinct product markets within the broader category of virtualization software, but ultimately left the market definition open.

(125) In *Dell/EMC*<sup>94</sup>, the Commission considered whether the market for Container Infrastructure Software was worldwide or at least EEA-wide, but ultimately left the exact scope of the relevant geographic market open.

#### **4.3.2.2. Notifying Party's views**

(126) The Notifying Party submits that IDC defines three submarkets within the functional market for Software Defined Compute Software: (i) Container Infrastructure Software, (ii) Virtual Machine Software, and (iii) Cloud System Software. According to the Notifying Party, the Transaction does not raise any concerns on any of the possible segmentations, and the precise product market definition can be left open.<sup>95</sup>

(127) The Notifying Party submits that, in line with the Commission decisions listed at paragraphs (124)-(125), the relevant geographic market for Container Infrastructure Software is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>96</sup>

#### **4.3.2.3. Commission's assessment**

(128) In line with *Dell/EMC* and IDC's segmentation, a possible market for Container Infrastructure Software can be identified. Nevertheless, the Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest product market definition identified by IDC for which market shares data is available and which leads to the highest combined market shares of the Parties. As only the subsegment for Container Infrastructure Software is affected, the Commission carried out the competitive assessment in Section 5.2.8 on the basis of the segmentation put forward by the Notifying Party in accordance with IDC's segment for Container Infrastructure Software.

(129) In line with the Commission decisions listed at paragraphs (124)-(125), the Commission considers that the relevant geographic market for Container Infrastructure Software is at least EEA-wide if not global. For the purpose of the present decision, the exact geographic market definition can be left open as the

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<sup>93</sup> Commission decision of 25 January 2016 in case M.7861 *Dell/EMC*, paragraph 67.

<sup>94</sup> Commission decision of 25 January 2016 in case M.7861 *Dell/EMC*, paragraph 70.

<sup>95</sup> See Form CO, paragraphs 587-592.

<sup>96</sup> See Form CO, paragraph 593.

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

#### **4.3.3. Network Management Software**

- (130) Network management software is designed to reduce the burden on IT teams by facilitating and automating the network management process. Network management software monitors the devices connected to the network and collects reportable data on these devices. When the software detects a problem on the network (e.g. network faults, performance bottlenecks, or compliance issues), the software will either take any necessary remedial action automatically, or it will present the data to the relevant network administrator which allows the administrator quickly to identify and resolve the problem.
- (131) IBM has one offering with network management features, i.e. IBM Netcool Network Management. Red Hat offers Red Hat Ansible Network Automation.

##### **4.3.3.1. Commission precedents**

- (132) There is no Commission precedent with regard to Network Management Software.

##### **4.3.3.2. Notifying Party's views**

- (133) The Notifying Party submits that the IDC segment for Network Management Software constitutes the relevant product market. The IDC taxonomy identifies a functional market for Network Management Software and does not segment this functional market further. According to the Notifying Party, the Transaction does not raise any concerns on any of the possible segmentations, and the precise product market definition can be left open.<sup>97</sup>
- (134) The Notifying Party submits that, in line with Commission's previous decisions concerning software, the relevant geographic market for Network Management Software is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>98</sup>

##### **4.3.3.3. Commission's assessment**

- (135) In line with IDC taxonomy, the possible market for Network Management Software can be identified. Nevertheless, the Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest product market definition identified by IDC for which market shares data is available and which leads to the highest combined market shares of the Parties.
- (136) The Commission considers that the relevant geographic market for Network Management Software is at least EEA-wide, if not global. For the purpose of the present decision, the exact geographic market definition can be left open as the

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<sup>97</sup> See Form CO, paragraphs 676-678.

<sup>98</sup> See Form CO, paragraph 679.



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

#### **4.3.4. Storage Management Mainframe Software**

- (137) Storage Management Mainframe Software includes tools for storage mainframe implementations, including for archive, backup and recovery, core storage, data replication, and device resource management.
- (138) IBM offers DFSMS, which comprises a suite of related data and storage management products for the z/OS operating system focused on managing the life-cycle of data and the devices and media associated with that data. Red Hat is not active in Storage Management Mainframe Software.

##### **4.3.4.1. Commission precedents**

- (139) In *Symantec/Veritas*<sup>99</sup>, the Commission considered the market definition for storage software more generally and considered that it was not necessary to distinguish the segments backup and archive software according to the OS on which software may run nor according to customer but category and ultimately left the market definition open.
- (140) In *Symantec/Veritas*<sup>100</sup>, the Commission considered whether the market for Storage Software was worldwide or at least EEA-wide, but ultimately left the exact scope of the relevant geographic market open.

##### **4.3.4.2. Notifying Party's views**

- (141) The Notifying Party refers to Gartner's macromarket for Storage Management Software, which is further divided into nine subsegments, including Storage Management Mainframe Software.<sup>101</sup> The Notifying Party submits that the relevant product market should encompass all software that manages, stores and/or ensures the accessibility, availability, and performance of information stored on physical storage media, and Storage Management Mainframe Software falls within that product market.
- (142) In the Notifying Party's view, vendors of storage software (including Dell EMC, Veritas, NetApp, Microsoft and HPE) are all active across a wide range of storage software and offer products with comparable levels of support and interoperability. The Notifying Party submits that these vendors, together with a number of other vendors and unpaid open source offerings, provide credible alternatives to and exercise a competitive constraint on IBM's storage software offering.<sup>102</sup>
- (143) According to the Notifying Party, the Transaction does not raise any concerns on any of the possible segmentations, and the precise product market definition can

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<sup>99</sup> Commission decision of 15 March 2005 in case M.3697 *Symantec/Veritas*, paragraphs 15-16.

<sup>100</sup> Commission decision of 15 March 2005 in case M.3697 *Symantec/Veritas*, paragraph 21.

<sup>101</sup> The other segments are: (i) Archive, (ii) Backup and Recovery, (iii) Management Software Defined Storage, (iv) Data Replication, (v) Infrastructure Software-Defined Storage, (vi) File Analysis, (vii) Storage Resource Management, and (viii) Other Storage Management Software.

<sup>102</sup> See Form CO, paragraph 765.

be left open. For the purpose of the present decision, the Notifying Party provides information needed to carry out the competitive assessment in Section 5.3.7.3 on the basis of Gartner's sub-segment for Storage Management Mainframe Software, the only one of the nine sub-segments in which IBM is active.<sup>103</sup>

- (144) The Notifying Party submits that, in line with Commission's previous decisions concerning software, the relevant geographic market for Storage Management Mainframe Software is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>104</sup>

#### **4.3.4.3. Commission's assessment**

- (145) In line with the Commission decision in *Symantec/Veritas* and Gartner's segmentation, a possible product market for Storage Management Mainframe Software can be identified. The Commission considers that for the purpose of the present decision the question whether Storage Management Mainframe constitutes a relevant product market and whether it needs to be further sub-segmented into different types of storage depending on their use can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest possible product market definition for which market shares data is available. As Gartner's segment for Storage Management Mainframe Software is the only one affected by the Transaction, the Commission carried out the competitive assessment in Section 5.3.7.3 on the basis of the segmentation put forward by the Notifying Party in accordance with Gartner's segment for Storage Management Mainframe Software.

- (146) The Commission considers that the relevant geographic market for Storage Management Mainframe Software is at least EEA-wide, if not global. For the purpose of the present decision, the exact geographic market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under any plausible geographic market definition.

#### **4.3.5. Security Information and Event Management Software**

- (147) Security information and event management products provide a real-time analysis of the security alerts that have been generated by applications and network hardware. Once security threats (e.g. attacks by a hacker) have been identified, the product alerts the business to the attack and automates the response to such incident.
- (148) IBM offers the QRadar family of products which provides an overview visibility of any organization's security system, since they are able to detect security offences and report them, as well as provide insight that allow teams to respond quickly to reduce the impact of incidents. Red Hat is not active in security information and event management software.

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<sup>103</sup> See Form CO, paragraphs 763-766.

<sup>104</sup> See Form CO, paragraph 767.

#### **4.3.5.1. Commission precedents**

- (149) In *Intel/McAfee*<sup>105</sup>, the Commission segmented the market for Security Software following IDC and identified IDC's functional market Endpoint Security as the relevant product market. It also envisaged further segmentation according to the type of end-customers, but ultimately left the market definition open.<sup>106</sup>
- (150) In *Intel/McAfee*, the Commission considered whether the market for Security Software was worldwide or at least EEA-wide, but ultimately left the exact scope of the relevant geographic market open.

#### **4.3.5.2. Notifying Party's views**

- (151) The Notifying Party submits that in line with the Commission decision listed at paragraph (149), the relevant market is the IDC segment for Security Analytics, Intelligence, Response, and Orchestration Software. However, as under this IDC segment, a non-horizontally affected market does not arise, the Notifying Party provides information needed to carry out the competitive assessment in Section 5.3.7.3 on the basis of Gartner's sub-segment for Security Information and Event Management Software. According to the Notifying Party, the Transaction does not raise any concerns on any of the possible segmentations, and the precise product market definition can be left open.<sup>107</sup>
- (152) The Notifying Party submits that, in line with line with Commission's previous decisions concerning software, the relevant geographic market for Security Information and Event Management Software is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>108</sup>

#### **4.3.5.3. Commission's assessment**

- (153) In line with the Commission decision in *Intel/McAfee* and Gartner's segmentation, a possible product market for Storage Management Mainframe Software can be identified. Nevertheless, the Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest possible product market definition for which market shares data is available. As no IDC segments would be affected by the Transaction, the Commission therefore carried out the competitive assessment in Section 5.3.7.3 on the basis of the segmentation put forward by the Notifying Party in accordance with Gartner's narrower segment for Security Information and Event Management Software.
- (154) The Commission considers that the relevant geographic market for Security Information and Event Management Software is at least EEA-wide, if not global. For the purpose of the present decision, the exact geographic market definition can be left open as the Transaction does not raise serious doubts as to its

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<sup>105</sup> Commission decision of 26 January 2011 in case M.5984 *Intel/McAfee*.

<sup>106</sup> Commission decision of 26 January 2011 in case M.5984 *Intel/McAfee*, paragraph 50.

<sup>107</sup> See Form CO, paragraphs 782-785.

<sup>108</sup> See Form CO, paragraph 786.

compatibility with the internal market under any plausible geographic market definition.

#### **4.3.6. Security Testing**

- (155) Security testing encompasses products aimed at software developers that want to test their web and mobile applications prior to deployment, to detect and fix any security issues. Security testing refers to both dynamic application security testing (“DAST”)<sup>109</sup> and static application security testing (“SAST”)<sup>110</sup>.
- (156) IBM offers IBM Security AppScan which is a family of web security testing and monitoring tools. Red Hat is not active in Security Testing Software.

##### **4.3.6.1. Commission precedents**

- (157) In *Intel/McAfee*<sup>111</sup>, the Commission segmented the market for security software following IDC and identified Endpoint Security. It also envisaged further segmentation according to the type of end-customers, which is an IDC functional market, as the relevant product market.
- (158) In *Intel/McAfee*<sup>112</sup>, the Commission considered whether the market for Security Software was worldwide or at least EEA-wide, but ultimately left the exact scope of the relevant geographic market open.

##### **4.3.6.2. Notifying Party's views**

- (159) The Notifying Party submits that the relevant product market with regard to Security Testing is IDC’s functional market for Other Security Software. However, as under this IDC segment, a non-horizontally affected market does not arise, the Notifying Party provides information needed to carry out the competitive assessment in Section 5.3.7.3 on the basis of Gartner’s sub-segment for Security Testing Software (which is narrower than the IDC segment).<sup>113</sup>
- (160) The Notifying Party submits that, with line with Commission’s previous decisions concerning software, the relevant geographic market for Security Testing Software is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>114</sup>

##### **4.3.6.3. Commission’s assessment**

- (161) In line with the Commission decision in *Intel/McAfee* and Gartner’s segmentation, a possible product market for Storage Management Mainframe Software can be identified. Nevertheless, the Commission considers that for the

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<sup>109</sup> DAST is a program that communicates with a web application through the web front-end to detect security vulnerabilities in the web application as well as architectural weaknesses.

<sup>110</sup> Static application security testing is a technology aimed at analyzing the source code, byte code and binaries from coding and design conditions that could indicate security vulnerabilities. Red Hat is not active in security testing software.

<sup>111</sup> Commission decision of 26 January 2011 in case M.5984 *Intel/McAfee*, paragraph 50.

<sup>112</sup> Commission decision of 26 January 2011 in case M.5984 *Intel/McAfee*, paragraph 55.

<sup>113</sup> See Form CO, paragraphs 793-796.

<sup>114</sup> See Form CO, paragraph 797.

purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest possible product market definition for which market shares data is available. As no IDC segments would be affected by the Transaction, the Commission therefore carried out the competitive assessment in Section 5.3.7.3 on the basis of the segmentation put forward by the Notifying Party in accordance with Gartner's segment for Security Testing Software.

- (162) The Commission considers that the relevant geographic market for Security Testing Software is at least EEA-wide, if not global. For the purpose of the present decision, the exact geographic market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under any plausible geographic market definition.

#### **4.3.7. Web Access Management Software**

- (163) Web access management software is a form of identity management that controls access to web resources, by providing authentication management, policy-based authorisations, reporting and auditing services as well as single sign-on convenience.

- (164) IBM's range of products<sup>115</sup> ensures that the relevant people have access to business resources, by providing access controls for web, mobile, cloud and legacy apps, as well as desktops, VPNs, and servers. Red Hat is not active in Web Access Management Software.

##### **4.3.7.1. Commission precedents**

- (165) In *Intel/McAfee*<sup>116</sup>, the Commission segmented the market for security software following IDC.
- (166) In *Intel/McAfee*<sup>117</sup>, the Commission considered whether the market for Security Software was worldwide or at least EEA-wide, but ultimately left the exact scope of the relevant geographic market open.

##### **4.3.7.2. Notifying Party's views**

- (167) The Notifying Party submits that the relevant product market with regard to its activities in Web Access Management Software is IDC's segment for Identity And Digital Trust Software. However, as under this IDC segment, a non-horizontally affected market does not arise, the Notifying Party provides information needed to carry out the competitive assessment in Section 5.3.7.3 on the basis of Gartner's sub-segment for Web Access Management Software (which is narrower than the IDC segment).<sup>118</sup>

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<sup>115</sup> IBM Security Access Manager, IBM Security Identity Governance and Intelligence, IBM Security Secret Server, IBM Cloud Identity, IBM Security Directory Suite, IBM Security Access Manager for Enterprise Single Sign-On, and IBM Security zSecure.

<sup>116</sup> Commission decision of 26 January 2011 in case M.5984 *Intel/McAfee*.

<sup>117</sup> Commission decision of 26 January 2011 in case M.5984 *Intel/McAfee*, paragraph 55.

<sup>118</sup> See Form CO, paragraphs 804-807.

- (168) The Notifying Party submits that, in line with line with Commission's previous decisions concerning software, the relevant geographic market for Web Access Management Software is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>119</sup>

#### **4.3.7.3. Commission assessment**

- (169) In line with the Commission decision in *Intel/McAfee* and Gartner's segmentation, a possible product market for Storage Management Mainframe Software can be identified. Nevertheless, the Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest possible product market definition for which market shares data is available. As no IDC segments would be affected by the Transaction, the Commission therefore carried out the competitive assessment in Section 5.3.7.3 on the basis of the segmentation put forward by the Notifying Party in accordance with Gartner's segment for Web Access Management Software.
- (170) The Commission considers that the relevant geographic market for Security Testing Software is at least EEA-wide, if not global. For the purpose of the present decision, the exact geographic market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under any plausible geographic market definition.

#### **4.3.8. Other IT Operations Management**

- (171) Gartner identifies IT Operations Management ("ITOM") Mainframe Tools as a distinct subsegment within the Gartner macromarket IT Operations Management. Other ITOM is a catch-all category that includes any management tools and/or integrated functionality not specifically covered by one of the other Gartner subsegments within its IT Operations Management macromarket. This includes: output management software used to manage hardware peripherals (such as printers); database administration automation and support tools that automate routine administration of databases; schema development and management; query analyzers; reorganization utilities; space tuners; and bulk data loading/unloading technologies.
- (172) IBM's products falling within the category of Other ITOM are: IBM Netcool Operations Insight<sup>120</sup> and IBM Operations Analytics<sup>121</sup>. Red Hat is not active in Other ITOM.

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<sup>119</sup> See Form CO, paragraph 808.

<sup>120</sup> Netcool Operations Insight is an operations center which provides a consolidated view of the alerts and alarms affecting an organization's IT system and filters out irrelevant or low-priority alerts.

<sup>121</sup> IBM Operations Analytics analyses operational big data to create insights for quicker problem solving and better overall service. The product can learn and understand how applications and their infrastructure should normally behave and interact, establish baselines for normal behavior, and issue alerts on detected anomalous behavior. It helps operational teams detect trends and forecast future problem prioritization and determination needs, thereby reducing repair times and improving operational efficiency.

#### **4.3.8.1. Commission precedents**

(173) There is no Commission precedent with regard to ITOM tools.

#### **4.3.8.2. Notifying Party's views**

(174) The Notifying Party submits that the relevant product market with regard to its activities in Other ITOM is IDC's segment for ITOM software. However, as under this IDC segment, a non-horizontally affected market does not arise, the Notifying Party provides information needed to carry out the competitive assessment in Section 5.3.7.3 on the basis of Gartner's sub-segment for Other ITOM Tools (which is narrower than the IDC segment). According to the Notifying Party, the Transaction does not raise any concerns on any of the possible segmentations, and the precise product market definition can be left open.<sup>122</sup>

(175) The Notifying Party submits that the relevant geographic market for Other ITOM is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>123</sup>

#### **4.3.8.3. Commission's assessment**

(176) In line with Gartner's segmentation, a possible product market for Other ITOM can be identified. Nevertheless, the Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest possible product market definition for which market shares data is available. As no IDC segments would be affected by the Transaction, the Commission therefore carried out the competitive assessment in Section 5.3.7.3 on the basis of the segmentation put forward by the Notifying Party in accordance with Gartner's segment for Other ITOM.

(177) The Commission considers that the relevant geographic market for Other ITOM is at least EEA-wide, if not global. For the purpose of the present decision, the exact geographic market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under any plausible geographic market definition.

#### **4.3.9. AD Mainframe Tools**

(178) Application Development ("AD") mainframe tools are used to develop and maintain applications that run on IBM's proprietary System z mainframes.<sup>124</sup> Red Hat is not active in AD mainframe tools.

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<sup>122</sup> See Form CO, paragraphs 816-819.

<sup>123</sup> See Form CO, paragraph 819.

<sup>124</sup> IBM offers a wide range of AD Mainframe Tools: IBM Developer for System z, IBM Application Discovery and Delivery Intelligence, IBM Application Delivery Foundation, IBM Application Performance Analyzer for z/OS, IBM Fault Analyzer for z/OS, IBM File Manager for z/OS, IBM Z Development and Test Environment, IBM Z Open Development, IBM Debug Tool, UrbanCode Deploy, IBM Rational Test Workbench, IBM Rational Integration Tester, Rational Team Concert, and IBM InfoSphere Optim Test Data Management.

#### **4.3.9.1. Commission precedents**

- (179) There is no Commission precedent with regard to AD Mainframe Tools but the Commission has considered the broader category of application development software in previous decisions. In these decisions, the Commission investigated different types of application development software constitute separate product markets, but ultimately left the market definition open.<sup>125</sup>
- (180) In its previous decisions considering application development software, the Commission considered whether the market was worldwide or at least EEA-wide, but ultimately left the exact scope of the relevant geographic market open.

#### **4.3.9.2. Notifying Party's views**

- (181) The Notifying Party submits that the relevant product market is Gartner's segment for AD Mainframe Tools, which is not segmented further. IDC does not identify a distinct segment for AD mainframe tools, although they are likely to fall within the IDC secondary market of Application Development Software.
- (182) According to the Notifying Party, while application development tools generally include multiple sets of products that enable application discovery, management, development, testing, debugging, DevOps, and performance analysis for application developers, AD Mainframe Tools include specific capabilities to enhance, simplify and automate these activities for developers and operational engineers who are producing and maintaining applications targeting the mainframe.<sup>126</sup>
- (183) In line with previous Commission decisions where different types of application development tools have tended to be considered distinct markets (discussed at paragraph (179) above), the Notifying Party considers AD mainframe tools as the relevant product market and provides shares of sales based on Gartner data for this segment.
- (184) The Notifying Party submits that the relevant geographic market for AD Mainframe Tools is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>127</sup>

#### **4.3.9.3. Commission's assessment**

- (185) In line with Gartner's segmentation, a possible product market for AD Mainframe Tools can be identified. Nevertheless, the Commission considers that for the purpose of the present decision, the exact product market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under the narrowest possible product market definition for which market shares data is available. The Commission therefore carried out the competitive assessment in Section 5.3.7.3 on the basis of the segmentation put

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<sup>125</sup> Commission decision of 8 March 2017 in case M.8223 *Micro Focus/HPE Software Business*, paragraph 32; Commission decision of 5 March 2008 in case M.4747 *IBM/Telelogic*, paragraph 122; Commission decision of 20 February 2003 in case M.3062 *IBM/Rational*, paragraphs 11, 16, 20, and 23.

<sup>126</sup> See Form CO, paragraphs 833-836.

<sup>127</sup> See Form CO, paragraph 837.



forward by the Notifying Party in accordance with Gartner’s segment for AD Mainframe Tools.

- (186) The Commission considers that the relevant geographic market for AD Mainframe Tools is at least EEA-wide, if not global. For the purpose of the present decision, the exact geographic market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market under any plausible geographic market definition.

#### 4.3.10. Server Operating Systems

- (187) Operating systems manage computer hardware (e.g., processing, memory, and storage) and all other programs in a computer. In the traditional IT stack, operating systems sit above hardware and below middleware and applications. Operating systems save application developers from tailoring their program to the specific hardware in each computer—instead, they write the program for an operating system which provides it with the necessary computer resources to run.
- (188) The vast majority of servers today run Windows or Linux operating systems. Windows<sup>128</sup> and Linux are estimated to account for more than [90-100]% of new server operating system deployments and more than [90-100]% of the installed base in 2017.<sup>129</sup> The remainder of deployments are either Unix<sup>130</sup> or other proprietary server operating systems, both of which have significantly declining sales and installed bases.<sup>131</sup>
- (189) Linux refers to a range of operating systems built on the Linux kernel, a free, open source operating system core developed by Linus Torvalds in the early 1990s. Because the Linux kernel is open source, it can be modified and tailored to suit different needs. As a result, a range of desktop, mobile, and server Linux distributions have emerged. Linux distributions can be maintained by the open source community, produced commercially—or both.<sup>132</sup>
- (190) Red Hat offers Red Hat Enterprise Linux (“RHEL”) and IBM’s operating systems are proprietary and based on either Unix or IBM’s own code base: z/OS, zVSE, zTPF, AIX, and IBM i. z/OS, zVSE, and zTPF run exclusively on IBM’s z

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<sup>128</sup> Microsoft started developing proprietary operating systems for personal computers (“PC”) in the early 1980s. Since 1993, Microsoft has also produced Windows operating systems for servers. The latest edition is Windows Server 2019, released in October 2018.

<sup>129</sup> IDC, *Worldwide Server Operating Environments Market Shares, 2017: Linux Fuels Market Growth* (2018).

<sup>130</sup> Unix is a family of operating systems that emerged from the Unix operating system developed by U.S. telecommunications provider AT&T in the late 1960s. AT&T originally provided the Unix source code for free. This led to diverse groups developing different versions of Unix, each tailored to their needs. Unix’s descendants ultimately coalesced into two broad groups—academic and commercial. Companies developed their own versions of Unix. The most well-known is Oracle’s (formerly Sun Microsystems’) Solaris. HP and IBM continue to market Unix-based systems today.

<sup>131</sup> IDC, *Worldwide Server Operating Environments Market Shares, 2017: Linux Fuels Market Growth* (2018).

<sup>132</sup> Canonical Ltd maintains Ubuntu and provides commercial support for Ubuntu’s Server edition (Ubuntu is also available unsupported for free) while SUSE sponsors free, community-based OpenSUSE and charges for SUSE Enterprise Linux. Oracle Corporation provides a commercially-supported version of Linux called Oracle Enterprise Linux. Other Linux-based operating systems include Amazon Linux, Debian, and Fedora.

processors, while AIX and IBM i run exclusively on IBM's POWER processor architecture.

#### **4.3.10.1. Commission precedents**

- (191) In *Oracle/Sun*, the Commission referred to its *Microsoft* antitrust decision<sup>133</sup> where it had identified a market for work group server operating systems, distinct from other software.<sup>134</sup> It did not segment server operating systems by processor type, or operating system family (i.e., Windows, Linux, or Unix), but ultimately left open the precise product market definition.
- (192) In *Oracle/Sun*, the Commission referred to its *Microsoft* antitrust decision where it identified a worldwide geographic market for server operating systems.

#### **4.3.10.2. Notifying Party's view**

- (193) The Notifying Party considers that the relevant product market for operating systems should encompass all server operating systems, i.e. Windows (server), Linux, Unix, including any "descendants" thereof, such as Solaris, HP-UX and AIX, and other proprietary operating systems, such as IBM i, z/OS, and z/VSE. This product market definition is consistent with the IDC submarket for Core Operating Systems (i.e. server operating systems). It submits that further segmentation of the product market for server operating systems between paid/unpaid or depending on the family (Linux, Windows, etc.) is not warranted. According to the Notifying Party, server operating systems all perform the same basic function, regardless of which "family" they are in.<sup>135</sup>
- (194) The Notifying Party submits that, in line with the Commission decisions listed at paragraphs (191)-(192), the relevant geographic market is global. Nevertheless, the Notifying Party also provided EEA-based market shares for completeness.<sup>136</sup>

#### **4.3.10.3. Commission's assessment**

- (195) RHEL is the most successful and widely used paid supported Linux distribution. The Commission therefore investigated whether the following categories of server operating systems can be considered part of the same relevant product market as paid supported Linux distributions: (1) free unsupported Linux distributions, (2) other free unsupported open-source operating systems, and (3) other paid supported operating systems from different families (e.g., Microsoft Windows, Unix-based operating systems such as IBM's AIX, Oracle's Solaris and HP-UX, and other proprietary operating systems).
- (196) As regards free unsupported Linux distributions, the Commission considers that demand-side substitution is most likely too limited to constraint a hypothetical monopolist in paid supported Linux distribution. This is for the following reasons.
- (197) First, a large majority of competitors responding to the market investigation considered that competition between paid Linux distributions and free

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<sup>133</sup> Commission decision of 24 April 2004 in case COMP/C-3/37.792 – *Microsoft*.

<sup>134</sup> Commission decision of 30 July 2009 in case M.5529 – *Oracle/Sun Microsystems*, recital 945.

<sup>135</sup> See Form CO, paragraphs 702-706.

<sup>136</sup> See Form CO, paragraph 707.

unsupported Linux distributions was either limited or very limited. Some competitors explained that free unsupported Linux distributions are not considered for mission-critical workloads. Within enterprises, free Linux distributions would mainly be used in testing and development efforts, but not in production.<sup>137</sup> Rival Linux distributors explained that customers who choose to go for a paid Linux distribution do it because they need the support. The Commission therefore considers that customers using paid Linux operating systems would be unlikely to switch to unsupported Linux distributions, at least for mission-critical workloads.<sup>138</sup>

- (198) Second, on the customers' side, a majority of them do not consider free unsupported Linux distributions to be possible alternatives to paid supported Linux distributions.<sup>139</sup> Customers explain that it is generally a company policy to opt for supported distributions, and unsupported alternatives would in any event not be considered.
- (199) As regards other free unsupported open-source operating systems, the Commission considers that demand-side substitution is most likely too limited to constrain a hypothetical monopolist in paid supported Linux distribution, for the same reasons as for free unsupported Linux distributions, i.e. support is considered crucial for most customers. In addition, switching from a Linux operating system to another family of operating systems is more difficult than from a Linux distribution to another Linux distribution.<sup>140</sup> This was confirmed by the market investigation. On the one hand, all competitors responding to the market investigation and expressing an opinion on the issue considered that competition between paid Linux distribution and other free unsupported open-source operating systems was either limited or very limited.<sup>141</sup> On the other hand, the vast majority of customers do not consider other free unsupported open-source operating systems to be possible alternatives to paid supported Linux distributions.<sup>142</sup>
- (200) As regards other paid supported operating systems from different families (e.g., Microsoft Windows, Unix-based operating systems such as IBM's AIX, Oracle's Solaris and HP-UX, and other proprietary operating systems), the Commission also considers that demand-side substitution is most likely too limited to constraint a hypothetical monopolist in paid supported Linux distribution. This is for the following reasons.

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<sup>137</sup> For instance, Oracle explains “[w]hile unsupported Linux distribution may be used by individuals and hobbyists or customers with limited needs, an enterprise will almost always require some sort of Linux support. This reality is reflected in Red Hat’s (and Oracle’s) revenue model where Linux is typically available for free but customers are charged for associated Linux support. One exception (and the reason we mark “limited” instead of “very limited”) is the use of Linux in testing and development efforts. In these cases customers are likely to use free Oracle or CentOS distributions, since Red Hat does not provide RHEL for free for testing/development purposes.” See replies to Questionnaire Q1 to competitors, question 40.

<sup>138</sup> See replies to Questionnaire Q1 to competitors, question 40.

<sup>139</sup> See replies to Questionnaire Q2 to customers, question 39.

<sup>140</sup> See replies to Questionnaire Q1 to competitors, question 40.

<sup>141</sup> See replies to Questionnaire Q1 to competitors, question 40.

<sup>142</sup> See replies to Questionnaire Q2 to customers, question 39.

- (201) First, although a majority of customers replied that they consider other operating system families (e.g. Microsoft Windows and Unix-based operating systems) to be possible alternatives to paid supported Linux distributions, their explanations suggest that they currently use different families of operating systems as complementary operating systems to manage different tasks/applications. However, when it comes to the possibility of switching applications, middleware or tools running on Linux, several customers explain that while most of those components could in principle run on Microsoft Windows or even Unix, switching would require significant effort and costs. As explained by one customer, “[i]n theory, Microsoft Windows could be an alternative to a paid supported Linux distribution, however, the migration cost, the time required and the acquisition of skills render this an unrealistic scenario”.<sup>143</sup>
- (202) Second, this view is also supported by competitors who generally explain that substitution is limited between Linux and other families of operating systems such as Windows and Unix, even when supported. According to a competitor, for application development, organisations tend to have most of their developers specialized in either the Linux environment or the Windows environment. Switching from one to the other is therefore unlikely.<sup>144</sup>
- (203) For third party software, although competitors generally explain that most software are compatible with both Linux and Windows, once they are running on Linux, switching to Windows would be very complex and expensive. The same is true for switching from Linux to Unix. For instance one customer explains that “[s]witching [between different families of] operating systems tends to be expensive and complex, requiring changes to the applications being run, as well as to the tools used to manage/operate the systems. Additionally, there can be substantial performance differences requiring re-testing and re-tuning of applications”. Windows, Linux, Unix and other families of operating systems would only be considered interchangeably for new applications/services deployment, which are both Windows and Linux compatible.<sup>145</sup>
- (204) In light of the above, the Commission considers that paid supported Linux server operating systems may constitute a distinct product market from (1) free unsupported Linux distributions, (2) other free unsupported open-source operating systems, and (3) other paid supported operating systems from different families (e.g., Microsoft Windows, Unix-based operating systems such as IBM’s AIX, Oracle’s Solaris and HP-UX, and other proprietary operating systems). In any event, for the purpose of this decision, it can be left open whether RHEL belongs to a relevant product market defined as (i) paid supported Linux server operating systems, (ii) paid supported server operating systems (including different families), (iii) paid supported and unpaid unsupported Linux distributions or (iv) all server operating systems, as under each of these alternatives the Transaction does not raise serious doubts as to its compatibility with the internal market.
- (205) As regards IBM’s operating systems which are based on either Unix (AIX) or on IBM’s own code base (e.g., z/OS), for the purpose of this decision, it can be left

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<sup>143</sup> See replies to Questionnaire Q2 to customers, question 39.

<sup>144</sup> See replies to Questionnaire Q1 to competitors, question 40.

<sup>145</sup> See replies to Questionnaire Q1 to competitors, question 40.

open whether IBM's server operating systems belong to (i) a distinct market for paid Unix and other paid operating system (other than Microsoft and Linux) on which IBM's market share is the highest, (ii) all paid supported operating systems or (iii) all server operating systems, as under each of these alternatives the Transaction does not raise serious doubts as to its compatibility with the internal market.

(206) In line with the Commission decisions listed at paragraphs (191)-(192), the Commission considers that the relevant geographic market for Server Operating Systems is worldwide. Nevertheless, for completeness, the Commission carried out the competitive assessment in sections 5.2.10., 5.3.3. and 5.3.7. also at the EEA-wide level.

#### 4.4. Servers

##### 4.4.1. Commission precedents

(207) In past decisions, the Commission has focused on x86 servers and considered a segmentation by price band: (a) entry-level (below USD 100,000), (b) mid-range (USD 100,000 – USD 999,999), and (c) high-end (USD 1 million and above).<sup>146</sup> The Commission ultimately left the product market definition open.<sup>147</sup>

(208) The Commission found the market for servers to be at least EEA-wide if not worldwide.<sup>148</sup>

##### 4.4.2. Notifying Party's view

(209) The Notifying Party considers that the relevant product market should encompass all servers.<sup>149</sup>

(210) First, the Notifying Party submits that customers are increasingly opting for a "scale out" model, where their computing requirements are performed by networks of lower-priced servers, instead of one or two high capacity servers. This model affords customers greater flexibility to scale their server requirements according to predicted growth and usage, reduce idle server capacity, and manage overall capex for IT hardware. The capabilities of such horizontal server architectures (*i.e.*, networks of servers) were previously limited by the capability of software to exploit network computer resources, and the complexities of managing multiple hardware clusters. However, advances in network technology and virtualization technology now enable distributed server systems to deliver comparable levels of security, reliability, and performance to single large-capacity servers. The emergence of software-defined storage products now

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<sup>146</sup> Commission decision of 29 February 2016 in case M.7861 – *Dell/EMC*, paragraphs 38-42; Commission decision of 21 January 2010 in case M.5529 – *Oracle/Sun Microsystems*, recital 941; Commission decision of 29 February 2016 in case M.7861 – *Dell/EMC*, paragraphs 19-22.

<sup>147</sup> *Ibid*, paragraph 45.

<sup>148</sup> Commission decision of 29 February 2016 in case M.7861 – *Dell/EMC*, paragraph 44; Commission decision of 21 January 2010 in case M.5529 – *Oracle/Sun Microsystems*, recital 950; Commission decision of 31 January 2002 in case M.2609 – *HP/Compaq*, paragraph 23.

<sup>149</sup> See Form CO, paragraph 257.

enables enterprises to unify multiple servers, consolidating them into a single “virtual pool” that can be centrally managed and provisioned.<sup>150</sup>

- (211) Second, according to the Notifying Party, customers are also migrating increasing volumes of workload to public cloud. Public cloud vendors predominantly provision their data center infrastructure with lower-priced servers. They rely on large numbers of inexpensive servers across networks of data centers to build in significant redundancy, ensure high availability, and guarantee their ability to elastically meet customer cloud computing needs.<sup>151</sup>
- (212) Finally, and in line with the above explanation, the Notifying Party submits that IDC and Gartner data also indicate a consistent increase in the share of revenues accounted for by lower-priced servers and a consistent decline in the share of revenues accounted for by mid-range and high-end servers year on year, which may suggest an increased competition from, and a general shift of workloads towards, lower-priced servers.<sup>152</sup>
- (213) The Notifying Party submits that the relevant geographic market for servers is worldwide. According to the Notifying Party, suppliers of servers are global enterprises and are active worldwide, there are no significant transport costs associated with servers, and customer preferences and product specifications do not tend to vary by geography.

#### **4.4.3. Commission’s assessment**

- (214) The Commission considers that for the purpose of this decision, it can be left open whether the market for servers would have to be further segmented according to the price band, because the Transaction does not raise serious doubts as to its compatibility with the internal market even in a plausible high-end server market where IBM’s position would be the strongest.
- (215) The Commission considers that for the purpose of the present decision, the exact geographic market definition can be left open as the Transaction does not raise serious doubts as to its compatibility with the internal market whether the geographic market is EEA-wide or worldwide.

#### **4.5. IT services**

- (216) IBM markets IT Services to enterprises under the IBM Services brand. IBM Services includes two operationally distinct businesses, Global Business Services (“GBS”) and Global Technology Services (“GTS”), each with a different focus: GBS mainly provides strategy and architecture consulting services, while GTS generally provides outsourcing services.

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<sup>150</sup> See the Notifying Party’s response to the Commission’s RFI 16.

<sup>151</sup> See the Notifying Party’s response to the Commission’s RFI 16.

<sup>152</sup> According to Gartner, between 2015 and 2018, the proportion of low-end servers grew from [80-90]% to [90-100]% of the worldwide market by value. The proportion of mid-range and high-end servers both declined in the same period, from [5-10]% and [5-10]% to [0-5]% and [5-10]%, respectively. According to IDC, between 2015 and 2018, low-end servers grew from [80-90]% to [90-100]% of the worldwide market by value, while the proportion of mid-range and high-end servers shrunk from [5-10]% and [5-10]% to [5-10]% and [0-5]%, respectively. See the Notifying Party’s response to the Commission’s RFI 16.

#### **4.5.1. Commission precedents**

- (217) In its most recent decisions, the Commission has considered segmenting IT services on the basis of (i) the functionality of the service and (ii) industry sector, but ultimately left the precise product market definition open.<sup>153</sup> In these decisions, the Commission relied on market data and the segments published by Gartner.
- (218) In previous decisions, the Commission, while considering that IT services are provided on a national basis, also pointed that the market could have a broader geographic scope, as major providers of IT services operate on a worldwide basis and customers frequently issue worldwide/EEA-wide tenders.<sup>154</sup>

#### **4.5.2. Notifying Party's view**

- (219) The Notifying Party submits that, for the purposes of the present case, the relevant market comprises all IT Services, and that this market should not be further sub-segmented because of a high degree of supply side substitutability, as well as the fact that many suppliers are active across various service categories, industries or customer groups.
- (220) From a geographic standpoint, the Notifying Party considers the relevant market to be worldwide in scope given the worldwide activities of providers of IT Services as well as developers and vendors of these software products, common customer preferences across the globe, negligible transport costs, maintenance and support services (commonly provided via the Internet), and limited trade barriers.

#### **4.5.3. Commission's assessment**

- (221) The Commission considers that, for the purpose of this decision, it can be left open whether the market for IT services would have to be further segmented according to (i) the functionality of the service and (ii) industry sector, because the Transaction does not raise serious doubts as to its compatibility with the internal market irrespective of the exact market definition. The Commission also considers that, for the purpose of this decision, it can be left open whether IT services markets are national, EEA-wide or worldwide, because the Transaction does not raise serious doubts as to its compatibility with the internal market irrespective of the exact geographic market definition.

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<sup>153</sup> Commission decision of 15 December 2014 in case M.7458 – *IBM/INF Business of Deutsche Lufthansa*, paragraphs 16-29 and 33; Commission decision of 19 June 2013 in case M.6921 – *IBM Italia/UBIS*, paragraphs 12-24 and 25; Commission decision of 18 November 2004 in case M. 3571 – *IBM/Maerskdata/DM data*, paragraphs 9-14; Commission decision of 23 September 2002 in case M.2946 – *IBM/PWC Consulting*, paragraphs 9-13.

<sup>154</sup> Case M.6237 – *Computer Sciences Corporation / iSoft Group*, Commission decision of 20 June 2011, paragraphs. 17-18.

## 5. COMPETITIVE ASSESSMENT

### 5.1. Analytical framework

- (222) Article 2 of the Merger Regulation provides that: “[a] concentration which would significantly impede effective competition, in the common market or in a substantial part of it, in particular as a result of the creation or strengthening of a dominant position, shall be declared incompatible with the common market”. Under Article 2(2) and (3) of the Merger Regulation, the Commission must thus assess whether a proposed concentration would significantly impede effective competition in the internal market or in a substantial part of it, in particular through the creation or strengthening of a dominant position.
- (223) In this respect, a concentration may entail horizontal and/or non-horizontal effects. Horizontal effects are those deriving from a concentration where the undertakings concerned are actual or potential competitors of each other in one or more of the relevant markets concerned. Non-horizontal effects are those deriving from a concentration where the undertakings concerned are active in different relevant markets.
- (224) As regards non-horizontal concentrations, two broad types of such concentrations can be distinguished: vertical concentrations and conglomerate concentrations.<sup>155</sup> Vertical concentrations involve companies operating at different levels of the supply chain.<sup>156</sup> Conglomerate concentrations are concentrations between firms that are in a relationship which is neither horizontal (as competitors in the same relevant market) nor vertical (as suppliers or customers).<sup>157</sup>
- (225) A concentration may entail both horizontal and non-horizontal effects. This may for instance be the case when the merging firms are not only in a vertical or conglomerate relationship, but are also actual or potential competitors of each other in one or more of the relevant markets concerned. In such a case, the Commission will appraise horizontal, vertical and/or conglomerate effects in accordance with the guidance set out in the relevant notices.<sup>158</sup>
- (226) The Commission appraises horizontal effects in accordance with the guidance set out in the relevant notice, that is to say the Horizontal Merger Guidelines.<sup>159</sup> Additionally, the Commission appraises non-horizontal effects in accordance with the guidance set out in the relevant notice, that is to say the Non-Horizontal Merger Guidelines. Finally, the Commission appraises innovation competition in accordance with the analytical framework for the assessment of horizontal non-coordinated effects in the Horizontal Merger Guidelines which is also largely applicable to innovation.

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<sup>155</sup> Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings ("Non-Horizontal Merger Guidelines"), OJ C 265, 18.10.2008, recital 3.

<sup>156</sup> Non-Horizontal Merger Guidelines, recital 4.

<sup>157</sup> Non-Horizontal Merger Guidelines, recital 5.

<sup>158</sup> Non-Horizontal Merger Guidelines, recital 7.

<sup>159</sup> Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings ("Horizontal Merger Guidelines"), OJ C 31, 05.02.2004.



### 5.1.1. *Horizontal effects*

- (227) In addition to the creation or strengthening of a dominant position, the Horizontal Merger Guidelines distinguish between two other ways in which concentrations between actual or potential competitors on the same relevant market may significantly impede effective competition, namely non-coordinated and coordinated effects.
- (228) Recital 25 of the Preamble to the Merger Regulation clarifies that "*under certain circumstances, concentrations involving the elimination of important competitive constraints that the merging parties had exerted upon each other, as well as a reduction of competitive pressure on the remaining competitors, may, even in the absence of a likelihood of coordination between the members of the oligopoly, result in a significant impediment to effective competition*".<sup>160</sup> It further clarifies that the notion of significant impediment to effective competition "*should be interpreted as extending, beyond the concept of dominance, only to the anticompetitive effects of a concentration resulting from the non-coordinated behaviour of undertakings which would not have a dominant position on the market concerned*".<sup>161</sup>
- (229) The Horizontal Merger Guidelines list a number of factors which may influence whether or not significant horizontal non-coordinated effects are likely to result from a concentration, such as the large market shares of the merging firms, the fact that the merging firms are close competitors, the limited possibilities for customers to switch suppliers, or the fact that the merger would eliminate an important competitive force. That list of factors applies equally regardless of whether a concentration would create or strengthen a dominant position, or would otherwise significantly impede effective competition due to non-coordinated effects. Furthermore, not all of these factors need to be present to make significant non-coordinated effects likely and it is not an exhaustive list.<sup>162</sup> Finally, the Horizontal Merger Guidelines describe a number of factors, which could counteract the harmful effects of a merger on competition, including the likelihood of buyer power, entry and efficiencies.

### 5.1.2. *Vertical effects*

- (230) The Non-horizontal Merger Guidelines recognises that non-horizontal concentrations are generally less likely to significantly impede effective competition than horizontal concentrations.<sup>163</sup>
- (231) Vertical non-coordinated effects may principally arise when non-horizontal concentrations give rise to foreclosure.<sup>164</sup> A concentration is said to result in foreclosure where actual or potential rivals' access to supplies or markets is hampered or eliminated as a result of the merger, thereby reducing these

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<sup>160</sup> Merger Regulation, recital 25. Similar wording is also found in paragraph 25 of the Horizontal Merger Guidelines.

<sup>161</sup> Merger Regulation, recital 25.

<sup>162</sup> Horizontal Merger Guidelines, paragraph 26.

<sup>163</sup> Non-horizontal Merger Guidelines, paragraph 11.

<sup>164</sup> Non-horizontal Merger Guidelines, paragraph 18.

companies' ability and/or incentive to compete.<sup>165</sup> Such foreclosure may discourage entry or expansion of rivals or encourage their exit. Such foreclosure is regarded as anti-competitive where the merged entity — and, possibly, some of its competitors as well — are as a result able to profitably increase the price charged to consumers.<sup>166</sup>

- (232) Two forms of vertical foreclosure can be distinguished.<sup>167</sup> The first is where the concentration is likely to raise the costs of downstream rivals by restricting their access to an important input (input foreclosure). The second is where the merger is likely to result in foreclosure of upstream rivals by restricting their access to a sufficiently large customer base (customer foreclosure).

### 5.1.3. *Conglomerate effects*

- (233) In the majority of circumstances, conglomerate concentrations do not lead to any competition problems but in certain specific cases there may be harm to competition.<sup>168</sup> The main concern in the context of conglomerate effects is that of foreclosure.<sup>169</sup> Conglomerate concentrations may allow the merged entity to combine products in related markets and this may confer on the merged entity the ability and incentive to leverage a strong market position from one market to another by means of tying or bundling, or other exclusionary practices.<sup>170</sup>
- (234) In assessing the likelihood of conglomerate effects, the Commission examines, first, whether the merged firm would have the ability to foreclose its rivals, second, whether it would have the economic incentive to do so and, third, whether a foreclosure strategy would have a significant detrimental effect on competition, thus causing harm to consumers. In practice, these factors are often examined together as they are closely intertwined.<sup>171</sup>

### 5.1.4. *Effects on innovation competition*

- (235) The Merger Regulation establishes a legal framework that is not limited to the assessment of price effects, but may also be based on the likelihood of the impact of other factors such as innovation, quality and choice. In that respect, the Union Courts have clarified that the prospective analysis consists of an examination of how a concentration might alter the factors which determine the state of competition on a given market in order to establish whether it would give rise to a significant impediment to effective competition.<sup>172</sup>
- (236) The Commission considers that innovation is an important criterion on the basis of which the appraisal of a concentration should be conducted. Paragraph 8 of the

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<sup>165</sup> Non-horizontal Merger Guidelines, paragraph 29.

<sup>166</sup> Non-horizontal Merger Guidelines, paragraph 29.

<sup>167</sup> Non-horizontal Merger Guidelines, paragraph 30.

<sup>168</sup> Non-horizontal Merger Guidelines, paragraph 92.

<sup>169</sup> Non-horizontal Merger Guidelines, paragraph 93.

<sup>170</sup> Non-horizontal Merger Guidelines, paragraph 93.

<sup>171</sup> Non-horizontal Merger Guidelines, paragraph 94.

<sup>172</sup> Judgment of 15 February 2005, *Commission v Tetra Laval*, C-12/03 P, EU:C:2005:87, paragraph 43; Judgment of 10 July 2008, *Bertelsmann and Sony v. Impala and Commission*, C-413/06 P, EU:C:2008:392, paragraph 47. See also Judgment of 9 March 2015, *Deutsche Börse v Commission*, T-175/12, EU:T:2015:148, in particular paragraph 177.

Horizontal Merger Guidelines clarifies that the merger control system established by the Merger Regulation aims at preventing mergers which would be likely to deprive customers of some of the benefits of effective competition, which are not only low prices, but also include high quality products, a wide selection of goods and services, and innovation (in the form of more, better and improved products).

- (237) A merger may deprive consumers of these benefits through an increase of market power, which in the same paragraph is defined as the ability of one or more firms to profitably increase prices, reduce output, choice or quality of goods and services, diminish innovation or otherwise influence parameters of competition.<sup>173</sup>
- (238) Therefore, in accordance with the Merger Regulation and the Horizontal Merger Guidelines, the Commission is required to prevent significant impediments to effective competition without limiting its assessment to either price effects or product and price competition between existing products. It is also part of the Commission's tasks to determine whether a transaction is likely to lead to diminished innovation competition and innovation.
- (239) Finally, The Commission considers that the framework set out in the Horizontal Merger Guidelines for the assessment of non-coordinated effects is not exclusively restricted to the appraisal of price competition between existing products but it is also largely applicable to innovation.<sup>174</sup>

## **5.2. Horizontal non-coordinated effects<sup>175</sup>**

### **5.2.1. Horizontally Affected Markets**

- (240) Based on 2018 data, the Notifying Party has identified 9 IDC or Gartner market segments<sup>176</sup> in which the Parties' combined market shares exceed 20% at the worldwide or EEA level as demonstrated in Table 1 below. Six of these segments are also non-horizontally affected. They are indicated in Italics in Table 1.

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<sup>173</sup> Paragraph 8 identifies innovation as one of the benefits that mergers may deprive customers of: “[e]ffective competition brings benefits to consumers, such as low prices, high quality products, a wide selection of goods and services, and innovation”. Increased market power may consist in the ability of one or more firms to profitably diminish innovation. Pursuant to paragraph 25, “mergers in oligopolistic markets involving the elimination of important competitive constraints that the merging parties previously exerted upon each other together with a reduction of competitive pressure on the remaining competitors may, even where there is little likelihood of coordination between the members of the oligopoly, also result in a significant impediment to competition.”

<sup>174</sup> See reasons as set out in case M.7932 – Dow/DuPont, paragraphs 1994 to 1999 and M.8084 – Bayer/Monsanto, 21 March 2018, paragraphs 68 to 74.

<sup>175</sup> The Commission does not consider that the change brought about by the Transaction is likely to lead to any horizontal coordinated effects in the product markets discussed at Section 5.2. In all horizontally affected markets, the demand is highly fragmented and there is limited transparency. The Transaction does not diminish these market characteristics which make coordination difficult. Furthermore, the Transaction does not significantly increase symmetry in these markets. Based on the market share figures presented in Tables 2-16, the markets will remain relatively asymmetrical post-Transaction. Therefore, horizontal coordinated effects are not discussed further in the following Sections.

<sup>176</sup> In some cases both the IDC and the broadly corresponding Gartner segments are affected. In these cases, the Commission relies on the IDC denomination.

**Table 1: Horizontally affected markets**

<b>Application Development and Deployment/Application Infrastructure</b>	
1.	<i>Deployment-Centric Application Platforms (IDC/Gartner)</i>
2.	<i>Business Process Management Suites (Gartner)</i>
3.	<i>Integration Software (IDC/Gartner)</i>
4.	<i>Event-Driven Middleware (IDC/Gartner)</i>
5.	<i>Business Rules Management Systems (IDC)</i>
<b>System Infrastructure Software</b>	
6.	<i>Software-Defined Storage Controller (IDC)</i>
7.	<i>Container Infrastructure Software (IDC)</i>
8.	<i>Network Management Software (IDC)</i>
9.	<i>Server Operating Systems (paid only) (IDC/Gartner)</i>

Source: Form CO

### 5.2.2. Deployment-centric application platforms

(241) The market shares of the Parties and their competitors in the IDC segment for DCAPs are presented in Tables 2-3.

**Table 2 – DCAPs (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[20-30]%</b>
Oracle	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Microsoft	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
SAP	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Google	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Salesforce.com	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Other	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%

Source: IDC

**Table 3 – DCAPs (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[30-40]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
Oracle	[...]	[30-40]%	[...]	[30-40]%	[...]	[20-30]%
Microsoft	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
SAP	[...]	[10-20]%	[...]	[10-20]%	[...]	[5-10]%
Google	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Micro Focus	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%

Source: IDC

(242) Based on the Gartner segment Application Platform Software (which broadly corresponds to the IDC segment for DCAPs), the combined market share of the Parties at the EEA level is [40-50]%; IBM ([30-40]%), Red Hat ([5-10]%).<sup>177</sup>

#### 5.2.2.1. Notifying Party's views

(243) In the Notifying Party's view, the Transaction is unlikely to raise any unilateral effects concerns in the possible market for DCAPs for the reasons set out below.<sup>178</sup>

(244) First, the Notifying Party submits that the Parties' revenue-based market shares are moderate, and the increment brought by the Transaction is very small. According to the Parties, in any event, their revenue-based market shares are overestimated as the IDC/Gartner methodology fails to capture the competitive strength of (i) Microsoft's .NET framework<sup>179</sup> and (ii) numerous free open-source alternatives.<sup>180</sup> The Notifying Party argues that the most widely used application servers are in fact free open source products with IBM's WAS and Red Hat's JBoss constituting a small percentage of the application servers in use.

(245) Second, according to the Notifying Party, WAS and JBoss are not close competitors. The Notifying Party submits that both Parties' application servers are Java EE-compliant but their offerings are significantly differentiated and target different use cases:

- (a) WAS is heavyweight and JBoss is lightweight;<sup>181</sup>
- (b) WAS is a "sophisticated" system of records, JBoss EAP only has basic system of records capabilities;<sup>182</sup>
- (c) WAS and JBoss have different technical characteristics;
- (d) WAS and JBoss do not have the same closest competitors.<sup>183</sup>

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<sup>177</sup> Using the Parties' best estimates, WAS' market share in 2018 is [20-30]% in value and [20-30]% in volume, while JBoss' market share is [5-10]% in value and [5-10]% in volume.

<sup>178</sup> Form CO, paragraphs 345-414.

<sup>179</sup> IDC's share data do not accurately capture Microsoft's application server software offered as part of Microsoft's pervasive .NET framework, while Gartner does not track Microsoft's .NET at all. This is because .NET is not a separate product but a framework built into Microsoft Windows.

<sup>180</sup> Free open source alternatives are e.g. Apache Tomcat, Spring on Tomcat, GlassFish application servers and their derivatives. Since these offerings do not generate revenues, their competitive position is better reflected in volume based market shares.

<sup>181</sup> According to the Notifying Party, WAS is a proprietary, "heavyweight" solution that is more suited to traditional, large on-premises workloads that require greater functionality and customisation. JBoss EAP is a highly-modular, open source solution that is designed for transitioning workloads to the cloud.

<sup>182</sup> The Notifying Party identified 3 different use cases to which DCAPs can cater: (i) workloads which require extensive and sophisticated back-end capabilities (high availability and cluster management, legacy integration, performance and optimisation, standards support), (ii) workloads which do not require one or more of these four back-end capabilities, and (iii) front end workloads. In the Notifying Party's view, [...]. The Notifying Party considers that there is competitive interaction between WAS and JBoss possibly only with regard to [...].

<sup>183</sup> The Notifying Party submits that WAS' closest competitors are [...]. JBoss competes primarily against other open source options, such as [...], as well as offers from public cloud providers (e.g.,

- (246) According to the Notifying Party, this is reflected in IBM’s and Red Hat’s win-loss data, which shows that WAS and JBoss EAP rarely compete.<sup>184</sup>
- (247) Third, in the Notifying Party’s view, unpaid open source application servers pose a significant competitive constraint. The Notifying Party considers that customers of DCAPs are sophisticated companies and open source enables them to self-support (thus removing the need to procure commercial support). The Notifying Party further submits that customers also have the possibility to procure commercial support for free open source DCAPs from third parties.<sup>185</sup>
- (248) Fourth, the Notifying Party argues that traditional application servers, and in particular Java EE application servers of the kind offered by IBM, are rapidly becoming obsolete, as the trend is away from “heavy” on-premises application servers toward lighter weight, open source options and, increasingly, middleware-as-a-service provided directly by public cloud providers (e.g. AWS, Microsoft, Google). In addition, the Notifying Party argues that frameworks alternative to Java are increasingly important (e.g., PHP-, Python-, and Ruby-based application servers and platforms). According to the Notifying Party, customers enjoy a considerable range of application server options, including alternative frameworks and cloud-based (Software as a Service (SaaS)/Platform as a Service (SaaS)) offerings, whereby the choice of application server and vendor is based on the application’s needs.

#### 5.2.2.2. Commission’s assessment

- (249) The Commission considers that, for the reasons set out below, the Transaction does not raise serious doubts as to its compatibility with the internal market on the potential market for DCAPs as a result of horizontal non-coordinated effects.
- (250) First, the increment brought by the Transaction is small. Based on IDC, the Transaction will result in a small global increment of [0-5]% in the possible worldwide market for DCAPs (and [0-5]% in the EEA). Based on Gartner, the increment of the Transaction is [5-10]%, while based on Parties’ own estimates of their market shares, the increment is [5-10]%.<sup>186</sup>
- (251) Second, the market investigation provided mixed results as to whether WAS and JBoss compete closely for the same use cases/types of applications.

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[...]), as well as offers from [...], and custom options that can be created by forking open source middleware (including Red Hat’s free, community-based application server, WildFly.

<sup>184</sup> According to the Notifying Party, JBoss EAP competed with WebSphere for only [...] % of WebSphere opportunities in 2017 and [...] % of the WebSphere opportunities in 2018.

<sup>185</sup> The Notifying Party submits that a significant number of third parties provide support for open source application platforms. Rogue Wave, MuleSoft and Tomitribe, for example, provide support for Tomcat in a similar way to Red Hat and Dell EMC’s Pivotal Tomcat offerings. Many other third parties provide up to date distributions and assistance, without necessarily providing full patch level support. Those third-party providers that offer support for Do-It-Yourself software add further competitive pressure on Red Hat and its competitors.

<sup>186</sup> The Commission attempted to carry out a market reconstruction in order to confirm the market shares in the possible market for DCAPs given the discrepancies between the market shares based on IDC/Gartner and the Parties’ own estimates. However, the Commission did not get sufficient replies to have meaningful results because certain third parties could not provide the data as requested. The reason is that certain third parties do not separately track their revenues derived from DCAPs (when they are sold as part of other offerings).

- (252) The market results indicate that there is a wide range of functionalities and use cases which DCAPs can support, depending on customers' needs and preference. A competitor expressed the view that customers do not distinguish between back-end workloads and front-end workloads but *“in general customers are looking for an application server platform that supports the Java EE APIs and that is generally applicable to the wide range of workloads found typically in a large organisation”*.<sup>187</sup> Customers responding to the market investigation confirm that their DCAPs choice depends on their technology decisions and needs when customers define the application stack.
- (253) Against that background, a number of market participants indicated that WebSphere and JBoss closely compete because both products are Java EE-compliant.<sup>188</sup> According to customers: *“Both platforms [WAS and JBoss] provide Java EE compliant hosting environments for both front and back-end applications”*.<sup>189</sup>
- (254) However, some respondents nevertheless point out that there are some technical differences between WebSphere and JBoss (and other Java EE compliant DCAPs). One customer explained that *“[they] continue to use Websphere for applications [...] where high availability and extremely heavy load”*.<sup>190</sup> A competitor explained that *“Red Hat is more suited for modern architecture (e.g. cloud and microservices), while WAS is more [suited for] traditional on-premise workloads”*.<sup>191</sup>
- (255) Furthermore, the win-loss data of the Parties indicates that IBM and Red Hat rarely compete for the same opportunities with regard to DCAPs. In 2017, JBoss competed with WAS for [...] % of WAS opportunities and in 2018 for [...] % of WAS opportunities.<sup>192</sup>
- (256) Third, the results of the market investigation strongly indicate that there will remain sufficient alternative providers post-Transaction to maintain the same level of competition on the market for DCAPs. Even within the narrow Java EE space, there are a number of credible alternatives to WAS and JBoss which are well suited to support a range of use cases. According to competitors and customers, the most prominent alternatives are Weblogic (Oracle), Tomcat and Glassfish. Competitors and customers also mention Pivotal tc Server Jetty, Wildfly, OpenLiberty and a large number of smaller alternatives (e.g. Apache Geronimo, Jonas, Resin, Blazix etc.).<sup>193</sup> The majority of customers which replied to the market investigation already today use in parallel more than one DCAP (some customers have more than three or four DCAPs).<sup>194</sup>

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<sup>187</sup> See replies to Questionnaire Q1 to competitors, question 14.1.

<sup>188</sup> See replies to Questionnaire Q2 to customers, question 6.

<sup>189</sup> See replies to Questionnaire Q2 to customers, question 6.1.

<sup>190</sup> See replies to Questionnaire Q1 to competitors, question 14.1.

<sup>191</sup> See replies to Questionnaire Q1 to competitors, question 6.

<sup>192</sup> This is in line with the Commission's analysis of the win-loss data of the Parties, according to which in 2018, JBoss competed with WAS for [...] % of WAS' opportunities and OpenShift (Red Hat's Container Infrastructure Software) in [...] % of WAS' opportunities. In 2018, [...] competed for [...] % of WAS' opportunities, while [...] competed for [...] % of the opportunities.

<sup>193</sup> See replies to Questionnaire Q2 to customers, question 6.2.

<sup>194</sup> See replies to Questionnaire Q2 to customers, question 4.

- (257) Fifth, the market investigation generally confirms that Java EE DCAPs such as WAS and JBoss are facing increasing competition from alternative platforms. Java EE (and in particular DCAPs such as WAS and Weblogic which are more suited for legacy applications) are becoming less relevant as customers move to newer technologies or application architectures (e.g. DCAPS for applications built as a system of micro-services, container infrastructure software etc.). There are also alternative platforms which are gaining in prominence (e.g. Springboot). According to a competitor: *“Java app server market is effectively a legacy market which is slowly declining. Java apps servers are rarely used for new workloads”*<sup>195</sup>. Oracle explained that *“it is a fast-moving area with many alternative offerings, whereby developers are often attracted to the new “flavour of the day” platforms such as e.g. Node.js”*.<sup>196</sup>
- (258) Sixth, customers consider that *“this is a well populated market segment”* and that *“there will remain a rich, competitive marketplace that will include proprietary and open source solutions outside of IBM and Red Hat”*. Furthermore, the majority of customers which responded to the market investigation consider that the impact of the Transaction on the level and intensity of competition on the DCAPs market is neutral.<sup>197</sup>
- (259) In addition to the many remaining proprietary and supported open source DCAPs, it can also be noted there are a number of free and unsupported open source DCAPs although, as explained in paragraph (37) above, the market investigation indicated that such free and unsupported open source DCAPs are considered as credible alternatives to proprietary or supported open-source DCAPs only for low-risk use cases but not for mission-critical applications.<sup>198</sup> However, based on the Notifying Party's submission and as confirmed by the market investigation, customers using open source DCAPs can and do procure commercial support either directly from vendors or from third parties specialised in providing commercial support for open source software such as Rogue Wave.<sup>199</sup> According to a competitor, commercial support is available for every open source DCAP.<sup>200</sup>
- (260) Therefore, the Commission considers that the merged entity will continue to face strong competitive constraints from alternative providers post-Transaction and competition on the possible market for DCAPs will not decrease as a result of the Transaction.

### 5.2.3. Business Process Management Suites

- (261) The market shares of the Parties and their competitors in the Gartner segment for BMP Suites are presented in Tables 4-5.

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<sup>195</sup> See replies to Questionnaire Q1 to competitors, question 13.

<sup>196</sup> Minutes of call with Oracle, 9 April 2018.

<sup>197</sup> See replies to Questionnaire Q2 to customers, question 60.

<sup>198</sup> See replies to Questionnaire Q2 to customers, question 15.

<sup>199</sup> See replies to Questionnaire Q2 to customers, question 16.

<sup>200</sup> See replies to Questionnaire Q2 to customers, question 15.1.



**Table 4 – BMP Suites (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
Oracle	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
OpenText	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Appian	[...]	[0-5]%	[...]	[0-5]%	[...]	[5-10]%
Pegasystems	[...]	[0-5]%	[...]	[5-10]%	[...]	[0-5]%
Software AG	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Other	[...]	[40-50]%	[...]	[30-40]%	[...]	[30-40]%

Source: Gartner

**Table 5 – BMP Suites (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
Oracle	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
OpenText	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Software AG	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Pegasystems	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Other	[...]	[40-50]%	[...]	[30-40]%	[...]	[30-40]%

Source: Gartner

### 5.2.3.1. Notifying Party's views

- (262) The Notifying Party submits that the Transaction is unlikely to raise any unilateral effects concerns in the possible market for BPM Suites for the reasons set out below.<sup>201</sup>
- (263) First, in the Notifying Party's view, the increment brought by the Transaction is negligible. The Transaction will result in a small global increment of [0-5]% in the possible market for BPM Suites (and [0-5]% in the EEA).
- (264) Second, the Notifying Party considers that the Parties' products are not close substitutes. According to the Notifying Party, IBM BPM and Red Hat Process Automation Manager are differentiated and have different target audience and feature set. IBM BPM is available for on-premises hosting as well as containerized and virtualized workloads. Red Hat Process Automation is a

<sup>201</sup> See Form CO, paragraphs 437-450.

lightweight, very flexible, and more technically oriented model driven environment.

- (265) With respect to their target audience, in the Notifying Party's view, IBM BPM is considered to be [...], while Red Hat Process Automation Manager is considered to be [...]. This is because Red Hat Process Automation Manager requires [...].<sup>202</sup>
- (266) The Notifying Party submits that in terms of feature set, IBM BPM includes a wider set of functionality to support business process creation and execution across a large organization, including: reusable templates, collaborative authoring up to unlimited process authors and end-users, and real-time reporting and analytics features to help refine business processes For these reasons, IBM BPM is better-positioned to cater to large-scale deployments compared to Red Hat Process Automation Manager.
- (267) In the Notifying Party's view, Red Hat views [...] as its strongest competitors, as they are leading providers of business process management suites, rated highly in analyst reports, and their products are often together on the shortlist when potential customers are considering to procure these products, even though their functionalities may be more closely comparable to IBM BPM. Red Hat does not view IBM as a close competitor, due to increasing customer emphasis on [...]. IBM considers its main competitors to be [...].
- (268) Third, the Notifying Party submits that a wide range of competitors will remain post-Transaction such as Oracle ([5-10]%), OpenText ([5-10]%), Pegasystems ([5-10]%), Software AG ([0-5]%), and K2 ([0-5]%). According to the Notifying Party, recent entrants in BPM offerings include Amazon, Aurea, Axon, BonitaSoft, BPM'online, Ultimus as well as Whitestein. Bizagi and BonitaSoft are significantly expanding [...].

#### **5.2.3.2. Commission's assessment**

- (269) The Commission considers that, for the reasons set out below, the Transaction does not raise serious doubts as to its compatibility with the internal market on the potential market for BPM Suites as a result of horizontal non-coordinated effects.
- (270) First, the increment brought by the Transaction is very small. As shown in Tables 4-5 above, the Transaction results in an increment of [0-5]% at the worldwide and [0-5]% at the EEA-wide level.
- (271) Second, a majority of customers responding to the market investigation consider that the Parties are not close competitors with regard to BPM Suites and there will remain sufficient alternative providers post-Transaction such as Appian, PegaSystems, Oracle, OpenText, TIBCO and others.<sup>203</sup> Furthermore, a majority of customers and competitors that responded to the market investigation

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<sup>202</sup> To deliver an application solution using Red Hat Process Automation Manager, custom Java development is typically required to connect the application to other systems, to create end-user interfaces and to perform common customizations.

<sup>203</sup> See replies to Questionnaire Q2 to customers, questions 20, 21, 22.

expressed the view that the Transaction will have a neutral impact on competition in the possible market for BPM Suites.<sup>204</sup>

(272) Therefore, the Commission considers that the merged entity will continue to face strong competitive constraints from alternative providers post-Transaction and that competition on the possible market for BPM Suites will not decrease as a result of the Transaction.

#### 5.2.4. Integration Software

(273) The market shares of the Parties and their competitors in the IDC segment for Integration Software and API Management Software are presented in Tables 6-8 below.

**Table 6 – Integration Software (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Oracle	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
ACI	[...]	[10-20]%	[...]	[10-20]%	[...]	[5-10]%
Microsoft	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
TIBCO	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Salesforce.com	-	-	-	-	[...]	[5-10]%
Others	[...]	[30-40]%	[...]	[40-50]%	[...]	[30-40]%

Source: IDC

**Table 7 – Integration Software (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
ACI	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Oracle	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Microsoft	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Software AG	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Microsoft	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Others	[...]	[20-30]%	[...]	[30-40]%	[...]	[30-40]%

Source: IDC

<sup>204</sup> See replies to Questionnaire Q2 to customers, question 60; Replies to Questionnaire 1 to competitors, question 67.

**Table 8 – API Management Software (Worldwide, 2015-2017)**

Company	2015		2016		2017	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[10-20]%	[...]	[20-30]%	[...]	[20-30]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>
Google	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
CA Technologies	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
AWS	[...]	[0-5]%	[...]	[0-5]%	[...]	[5-10]%
TIBCO	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Rogue Wave	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Others	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%

Source: IDC

#### 5.2.4.1. Notifying Party's views

- (274) The Notifying Party submits that the Transaction will unlikely to raise any unilateral effects concerns in the possible market for Integration Software for the reasons set out below.<sup>205</sup>
- (275) First, in the Notifying Party's view, the increment brought by the Transaction is negligible. The Transaction will result in a small global increment of [0-5]% in the possible market for Integration Software (and [0-5]% in the EEA).
- (276) Second, the Notifying Party considers that the Parties' products are not close substitutes. According to the Notifying Party, in both API management software and integration platforms the Parties' products have different features and are not each other's closest competitor. With respect to API Management Software, unlike IBM API Connect, Red Hat 3scale API Management does not support the design and building of APIs. 3scale API Management focuses instead on facilitating the management of APIs once deployed, by enabling users to distribute and monetize APIs and monitor and control their usage from a single interface. With respect to Integration Platforms, IBM does not often compete against Red Hat Fuse in customer deals and the Notifying Party does not consider that technology to be directly comparable (either from a revenue share perspective, analyst rankings, or customer/partner feedback).
- (277) Third, the Notifying Party submits that a wide range of competitors will remain post-Transaction such as Oracle ([10-20]%), ACI Worldwide ([10-20]%), Salesforce ([5-10]%), TIBCO ([5-10]%), and Microsoft ([5-10]%). In the narrower IDC-defined subsegment for API Management Software, in the Notifying Party's view, the principal competitors include Apigee (owned by Google) ([10-20]%), CA Technologies ([10-20]%), Amazon Web Services ([5-10]%), TIBCO (with Intel Mashery) ([5-10]%), and Rogue Wave (with Akana) ([5-10]%).

<sup>205</sup> See Form CO, paragraph 493.

#### **5.2.4.2. Commission's assessment**

- (278) The Commission considers that, for the reasons set out below, the Transaction does not raise serious doubts as to its compatibility with the internal market on the potential market for Integration Software as a result of horizontal non-coordinated effects.
- (279) First, the increment brought by the Transaction is very small. As shown in Tables 6-8 above, the Transaction results in an increment of [0-5]% at the worldwide and [0-5]% at the EEA-wide level. The increment on the possible sub-segment for API Management is [5-10]% at the worldwide level for 2017.
- (280) Second, a majority of customers responding to the market investigation consider that the Parties are not close competitors with regard to Integration Software and API Management Software and there will remain sufficient alternative providers post-Transaction such as Oracle, MuleSoft, Apigee, TIBCO, Dell Boomi, WSO2, CA Technologie, Software AG and others.<sup>206</sup> According to a customer, there are *“many vendors in this dynamic market, and plenty of alternatives”*.<sup>207</sup>
- (281) Furthermore, a majority of customers and competitors that responded to the market investigation expressed the view that the Transaction will have a neutral impact on competition in the possible market for Integration Software and its possible sub-segment for API Management Software.<sup>208</sup>
- (282) Therefore, the Commission considers that the merged entity will continue to face strong competitive constraints from alternative providers post-Transaction and competition on the possible market for Integration Software will not decrease as a result of the Transaction.

#### **5.2.5. Event-Driven Middleware**

- (283) The market shares of the Parties and their competitors in the IDC segment for Event-Driven Middleware are presented in Tables 9-10.

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<sup>206</sup> See replies to Questionnaire Q2 to customers, questions 23, 24, 25.

<sup>207</sup> See replies to Questionnaire Q2 to customers, question 23.

<sup>208</sup> See replies to Questionnaire Q2 to customers, question 60; replies to Questionnaire Q1 to competitors, question 67.

**Table 9 – Event-Driven Middleware (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[40-50]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[5-10]%
<b>Combined</b>	[...]	<b>[40-50]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
Amazon Web Services	[...]	[10-20]%	[...]	[20-30]%	[...]	[30-40]%
TIBCO	[...]	[10-20]%	[...]	[10-20]%	[...]	[5-10]%
Microsoft	-	-	[...]	[0-5]%	[...]	[0-5]%
Unicom	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Openet	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Oracle	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Other	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%

Source: IDC

**Table 10 – Event-Driven Middleware (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[40-50]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[40-50]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
Amazon Web	[...]	[10-20]%	[...]	[20-30]%	[...]	[20-30]%
TIBCO	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Bosch Software	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Unicom Systems	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Openet	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Other	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%

Source: IDC

(284) The market shares of the Parties and their competitors in the Gartner segment for Message-Oriented Middleware are presented in Tables 11-12.

**Table 11 – Message-Oriented Middleware (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[60-70]%	[...]	[50-60]%	[...]	[50-60]%
Red Hat	[...]	-	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[60-70]%</b>	[...]	<b>[50-60]%</b>	[...]	<b>[50-60]%</b>
Amazon	[...]	[0-5]%	[...]	[5-10]%	[...]	[10-20]%
TIBCO	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Alibaba	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Solace	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Microsoft	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%

Source: Gartner

**Table 12 – Message-Oriented Middleware (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[60-70]%	[...]	[50-60]%	[...]	[50-60]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[60-70]%</b>	[...]	<b>[50-60]%</b>	[...]	<b>[50-60]%</b>
Amazon	[...]	[0-5]%	[...]	[5-10]%	[...]	[10-20]%
TIBCO	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Solace	[...]	[5-10]%	[...]	[0-5]%	[...]	[0-5]%
Pivotal	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Microsoft	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%

Source: Gartner

#### 5.2.5.1. Notifying Party's views

- (285) The Notifying Party submits that the Transaction will unlikely to raise any unilateral effects concerns in the possible market for Event-Driven Middleware for the reasons set out below.<sup>209</sup>
- (286) First, in the Notifying Party's view, the increment brought by the Transaction is negligible. The Transaction will result in a small global increment of [0-5]% in the possible market for Event-Driven Middleware (and [0-5]% in the EEA).
- (287) Second, the Notifying Party considers that the Parties' products are not close substitutes. According to the Notifying Party, while Red Hat AMQ Streams is simply a scripted deployment of open source Kafka components on Red Hat OpenShift, IBM Event Streams is focused on delivering proprietary capabilities

<sup>209</sup> See Form CO, paragraph 509.

on top of Kafka. According to the Notifying Party, [...]. The Notifying Party submits that in comparison to Red Hat AMQ, IBM MQ comprises key technical differentiations including encryption at rest, support for XA transactions, once and once only delivery of messages, and both proven scalability and high availability, beyond any comparison with AMQ. In addition IBM MQ is supported on a wider variety of platforms including as a physical appliance.

- (288) The Notifying Party considers that the rapid growth in real-time use cases is a recent development and has the potential to be highly disruptive to the way customers approach and build their event-driven middleware solutions: they now have a wider range of technology choices from which to select the best fit for their requirements, depending on the relative importance of guaranteed delivery or real-time event streaming. This is likely to drive a shift in technology choices as customers review their use cases against the offerings available from different vendors (such as Microsoft (Event Hubs), TIBCO (Messaging Apache Kafka Distribution), and Stream.io, as well as the Apache Kafka open source project).
- (289) Third, the Notifying Party submits that a wide range of competitors will remain post-Transaction such as Amazon ([20-30]%), TIBCO ([10-20]%), Openet ([0-5]%), and Unicom Systems ([0-5]%). In addition, in the Notifying Party's view, barriers to entry are low, as evidenced by the high number of new market entrants, e.g. Apache Kafka Streaming, Amazon Kinesis Analytics, and eBay Pulsar.

#### 5.2.5.2. Commission's assessment

- (290) The Commission considers that, for the reasons set out below, the Transaction does not raise serious doubts as to its compatibility with the internal market on the potential market for Event-Driven Middleware as a result of horizontal non-coordinated effects.
- (291) First, the increment brought by the Transaction is very small. As shown in Tables 9-10 above, the Transaction results in an increment of [0-5]% at the worldwide and [0-5]% at the EEA-wide level. Under the Gartner segment for Message-Oriented Middleware, the increment brought by the Transaction is still negligible ([0-5]% at the worldwide and [0-5]% at the EEA level). In addition, even though under the Gartner segment, the Parties' combined market shares are [50-60]% at the worldwide and [50-60]% at the EEA level, the market shares of IBM have been substantially declining over the period 2016-2018 ([60-70]% in 2016 to [50-60]% in 2018 in the EEA). Over the same period, the market shares of competitors (e.g. AWS) have been increasing substantially (from [0-5]% in 2016 to [10-20]% in 2018 in the EEA).
- (292) Second, a majority of customers responding to the market investigation consider that the Parties are not close competitors with regard to Event-Driven Middleware and there will remain sufficient alternative providers post-Transaction such as Amazon Web Services ("AWS"), TIBCO, Oracle, Apache Kafka, Microsoft and others.<sup>210</sup> According to a customer, "*there are sufficient alternative credible providers which offer event driven middleware with event*

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<sup>210</sup> See replies to Questionnaire Q2 to customers, questions 26, 27, 28.



brokers, event streaming and stream processors capabilities with both hybrid and cloud deployment capabilities”.<sup>211</sup>

- (293) Furthermore, a majority of customers and competitors that responded to the market investigation expressed the view that the Transaction will have a neutral impact on competition in the possible market for Event-Driven Middleware.<sup>212</sup>
- (294) Therefore, the Commission considers that the merged entity will continue to face strong competitive constraints from alternative providers post-Transaction and competition on the possible market for Event-Driven Middleware will not decrease as a result of the Transaction.

#### 5.2.6. Business Rules Management Systems

- (295) The market shares of the Parties and their competitors in the IDC segment for BRMS are presented in Tables 13-14.

**Table 13 – Business Rules Management Systems (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>
FICO	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Pegasystems	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Bosch Software	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Oracle	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
CA Technologies	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Other	[...]	[10-20]%	[...]	[10-20]%	[...]	[20-30]%

Source: IDC

<sup>211</sup> See replies to Questionnaire Q2 to customers, question 26.

<sup>212</sup> See replies to Questionnaire Q2 to customers, question 60; replies to Questionnaire Q1 to competitors, question 67.

**Table 14 – Business Rules Management Systems (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[10-20]%</b>	[...]	<b>[10-20]%</b>	[...]	<b>[10-20]%</b>
Bosch Software	[...]	[30-40]%	[...]	[30-40]%	[...]	[30-40]%
FICO	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Pegasystems	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Oracle	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Progress Software	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Other	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%

Source: IDC

### 5.2.6.1. Notifying Party's views

- (296) The Notifying Party submits that the Transaction will unlikely to raise any unilateral effects concerns in the possible market for BRMS for the reasons set out below.<sup>213</sup>
- (297) First, in the Notifying Party's view, the increment brought by the Transaction is negligible. The Transaction will result in a small global increment of [0-5]% in the possible market for BRMS.
- (298) Second, the Notifying Party considers that the Parties' products are not close substitutes. According to the Notifying Party, IBM's and Red Hat's products are differentiated. Red Hat Decision Manager is perceived as a product that provides basic BRMS functionality, but which may be unsuitable for larger and more complex projects. Red Hat Decision Manager is a very minor product in the BRMS segment with a global sales share of only [0-5]%, and a marginal [0-5]% at EEA level.
- (299) The Notifying Party considers that most of Red Hat's competitors' products in this space have a wider set of capabilities. These products therefore share more similarities with IBM's offering. IBM ODM is more adapted to non-technical users due to its extensive natural language capabilities for rule development and definition. IBM ODM provides a wider range of capabilities, including testing and simulation (to allow users to model the impact of new rules before they are deployed) and collaborative working for rule authorship.<sup>214</sup>
- (300) Third, the Notifying Party submits that a wide range of competitors will remain post-Transaction such as Pegasystems ([10-20]%), FICO ([10-20]%), Bosch Software Innovations ([10-20]%), Oracle ([0-5]%), and CA Technologies ([0-5]%).

<sup>213</sup> See Form CO, paragraphs 537-542.

<sup>214</sup> According to the Notifying Party, machine learning is both disrupting and reviving interest in rules engines, and [...]. There are many new entrants in the machine learning space, a subset of which are exploring the potential synergy with rules-based/knowledge-engineering approaches.

### 5.2.6.2. Commission’s assessment

- (301) The Commission considers that, for the reasons set out below, the Transaction does not raise serious doubts as to its compatibility with the internal market on the potential market for BRMS as a result of horizontal non-coordinated effects.
- (302) First, the increment brought by the Transaction is very small. As shown in Tables 13-14 above, the Transaction results in an increment of [0-5]% at the worldwide level. The Parties’ combined market shares do not exceed 20% in the possible market for BRMS at the EEA level.
- (303) Second, a majority of customers responding to the market investigation consider that the Parties are not close competitors with regard to BRMS and there will remain sufficient alternative providers post-Transaction such as Pegasystems, Oracle, Bosch (Visual Rules), Open Text and others.<sup>215</sup>
- (304) Furthermore, a majority of customers and competitors that responded to the market investigation expressed the view that the Transaction will have a neutral impact on competition in the possible market for BRMS.<sup>216</sup>
- (305) Therefore, the Commission considers that the merged entity will continue to face strong competitive constraints from alternative providers post-Transaction and competition on the possible market for BRMS will not decrease as a result of the Transaction.

### 5.2.7. Software-Defined Storage Controller Software

- (306) The market shares of the Parties and their competitors in the IDC segment for Software-Defined Storage Controller Software are presented in Tables 15-16.<sup>217</sup>

**Table 15 – Software-Defined Storage Controller Software (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[20-30]%	[...]	[10-20]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>
VMware	[...]	[10-20]%	[...]	[10-20]%	[...]	[20-30]%
Dell	[...]	[0-5]%	[...]	[5-10]%	[...]	[10-20]%
Microsoft	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Nexenta	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
NetApp	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Other	[...]	[40-50]%	[...]	[60-70]%	[...]	[30-40]%

Source: IDC

<sup>215</sup> See replies to Questionnaire Q2 to customers, questions 29, 30, 31.

<sup>216</sup> See replies to Questionnaire Q2 to customers, question 60; replies to Questionnaire Q1 to competitors, question 67.

<sup>217</sup> IDC does not provide market shares data at the level of the four possible subsegments, i.e. (i) Block-Based, (ii) File-Based, (iii) Object-Based, and (iv) Hyperconverged Software-Defined Storage Controller Software.

**Table 16 – Software-Defined Storage Controller Software (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[30-40]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
VMware	[...]	[5-10]%	[...]	[10-20]%	[...]	[10-20]%
Dell	[...]	[0-5]%	[...]	[5-10]%	[...]	[10-20]%
Microsoft	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Nexenta	[...]	[5-10]%	[...]	[0-5]%	[...]	[0-5]%
Hewlett Packard Enterprise	-	-	[...]	[5-10]%	[...]	[0-5]%
Other	[...]	[30-40]%	[...]	[20-30]%	[...]	[20-30]%

Source: IDC

### 5.2.7.1. Notifying Party's views

- (307) The Notifying Party submits that the Transaction will unlikely to raise any unilateral effects concerns in the possible market for Software-Defined Storage Controller Software for the reasons set out below.<sup>218</sup>
- (308) First, in the Notifying Party's view, the increment brought by the Transaction is negligible. The Transaction will result in a small global increment of [0-5]% in the possible market for Software-Defined Storage Controller Software (and [0-5]% in the EEA).
- (309) Second, the Notifying Party considers that the Parties' products are not close substitutes. According to the Notifying Party, IBM's and Red Hat's products are differentiated. IBM's storage products are targeted for customers building standalone storage solutions, while Red Hat's storage offerings (Ceph and Gluster) focus on scale-out capabilities for existing platforms, such as Red Hat OpenStack Platform and Red Hat OpenShift. In addition, IBM Spectrum Scale competes in the high-performance computing area, in which Red Hat SDS offerings do not compete. IBM Spectrum Scale is significantly more complex than Red Hat Gluster Storage and is typically deployed by enterprises that demand extreme performance and scale where Red Hat Gluster Storage is not equipped to offer. IBM sees IBM Spectrum Scale competing more frequently with [...]. Furthermore, IBM Cloud Object Storage focuses on building standalone object storage as an active archive or content repository, while Red Hat Ceph Storage provides object, file, and block accesses and is primarily used to add scale-out capabilities to Red Hat's cloud platform products.
- (310) Third, the Notifying Party submits that a wide range of competitors will remain post-Transaction such as VMware, Dell EMC, Hitachi and Lustre, NetApp, and HPE.

<sup>218</sup> See Form CO, paragraph 570.

### 5.2.7.2. Commission's assessment

- (311) The Commission considers that, for the reasons set out below, the Transaction does not raise serious doubts as to its compatibility with the internal market on the potential market for Software-Defined Storage Controller Software (and any possible sub-segment thereof) as a result of horizontal non-coordinated effects.
- (312) First, the increment brought by the Transaction is very small. As shown in Tables 15-16 above, the Transaction results in an increment of [0-5]% at the worldwide level and [0-5]% at the EEA-wide level.
- (313) Second, a majority of customers responding to the market investigation consider that the Parties are not close competitors with regard to Software-Defined Storage Controller Software. Furthermore, the Parties' activities do not overlap according to Gartner's segmentation (IBM's products fall within the Management Software-Defined Storage subsegment, and Red Hat's SDS products fall within the Infrastructure Software-Defined Storage subsegment).<sup>219</sup>Based on the market investigation results, there will remain sufficient alternative providers post-Transaction such as VMware, Dell/EMC, HPE, NetApp, Nutanix, SUSE, Hitachi, AWS, Microsoft and others.<sup>220</sup> According to a customer, "*there's a healthy competition in the SDS market*".<sup>221</sup>
- (314) Furthermore, a majority of customers and competitors that responded to the market investigation expressed the view that the Transaction will have a neutral impact on competition in the possible market for Software-Defined Storage Controller Software (and any possible sub-segment thereof).<sup>222</sup>
- (315) Therefore, the Commission considers that the merged entity will continue to face strong competitive constraints from alternative providers post-Transaction and competition on the possible market for Software-Defined Storage Controller Software (and any possible sub-segment thereof) will not decrease as a result of the Transaction.

### 5.2.8. Container Infrastructure Software

- (316) The market shares of the Parties and their competitors in the IDC segment for Container Infrastructure Software are presented in Table 17.

**Table 17 – Container Infrastructure Software (Worldwide, 2015-2017)**<sup>223</sup>

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<sup>219</sup> See Form CO, paragraph 561.

<sup>220</sup> See replies to Questionnaire Q2 to customers, questions 32, 33, 34.

<sup>221</sup> See replies to Questionnaire Q2 to customers, question 32.

<sup>222</sup> See replies to Questionnaire Q2 to customers, question 60; replies to Questionnaire Q1 to competitors, question 67.

<sup>223</sup> The Notifying Party explained that IDC does not systematically report submarket-level data. The Notifying Party sourced worldwide shares of sales for 2015 – 2017 for the Container Infrastructure Software submarket from an ad-hoc IDC report, published in December 2018. The Notifying Party submits that a similar report containing 2018 data is not currently available. See Notifying Party's response to the Commission's RFI 22 of 18 June.

Company	2015		2016		2017	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[0-5]%	[...]	[5-10]%	[...]	[0-5]%
Red Hat	[...]	[60-70]%	[...]	[30-40]%	[...]	[30-40]%
<b>Combined</b>	[...]	<b>[60-70]%</b>	[...]	<b>[40-50]%</b>	[...]	<b>[30-40]%</b>
Docker	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
AWS	-	-	[...]	[0-5]%	[...]	[5-10]%
HPE	-	-	[...]	[0-5]%	[...]	[5-10]%
VMware			[...]	[0-5]%	[...]	[5-10]%
Google			[...]	[5-10]%	[...]	[0-5]%
Others	[...]	[20-30]%	[...]	[30-40]%	[...]	[30-40]%

Source: IDC

(317) According to the Notifying Party, market shares at the EEA level are not available as IDC does not publish market shares at that basis.

#### 5.2.8.1. Notifying Party's views

(318) The Notifying Party submits that the Transaction will unlikely to raise any unilateral effects concerns in the possible market for Container Infrastructure Software for the reasons set out below.<sup>224</sup>

(319) First, the Notifying Party argues that the market shares set out in Table 17 overstate the Parties' activities (and underestimate the total market size). According to the Notifying Party, IDC fails to capture container infrastructure software offerings (purchased as part of infrastructure subscriptions) of the public cloud providers, including Amazon, Microsoft, and Google, and free open-source Container Infrastructure Software.<sup>225</sup>

(320) Second, in the Notifying Party's view, container infrastructure software space is fragmented and highly competitive. IBM and Red Hat are just two of more than 40 other providers with certified Kubernetes distributions. The Notifying Party submits that [...] are all more significant competitors to Red Hat than IBM. The primary commercial non-Kubernetes competitor to Red Hat OpenShift has been [...] (i.e. a different open source container platform technology).

(321) Third, the Notifying Party argues that Red Hat's market share has been strongly declining (it [...] between 2015 and 2017) as other players are growing at a very

<sup>224</sup> See Form CO, paragraphs 610-622.

<sup>225</sup> The Notifying Party estimates that the public cloud players' own solutions represent approximately [...]% of container deployments (roughly broken down between Amazon ([...]%), Google ([...]%), Microsoft ([...]%), and other public clouds ([...]%), Dell EMC (Pivotal) approximately [...]%, Docker [...]%, and Rancher [...]%. Based on the Notifying Party's submission, Red Hat estimates its own share to be around [...]%, and IBM's at [...]%. Of the remaining [...], the majority reflects various other commercial vendors. The Notifying Party further submits that these estimates do not take into account enterprises' own DIY solutions using unpaid open source container infrastructure software, which Red Hat estimates stand for [...]% of all current container deployments.

significant rate.<sup>226</sup> These competing offerings, as well as those of recent and new entrants to the market, such as Microsoft, in the Notifying Party's view, will provide an increasingly strong competitive constraint on the combined entity post-Transaction.

- (322) Fourth, according to the Notifying Party, the Parties' offerings do not compete closely as they address different customer needs and use cases.<sup>227</sup> The Notifying Party submits that Red Hat's OpenShift is a robust platform for application development and deployment in any cloud environment and is positioned for use as a "run anywhere" container platform. By contrast, IBM's Cloud Private is primarily focused on [...].
- (323) Fifth, the Notifying Party considers that the container technology and the Container Infrastructure Software segment are nascent, evolving areas with constant new entry and a large number of players across a variety of technologies. While Kubernetes is recognised as the industry leader for orchestration, there is nonetheless still competitive pressure from non-Kubernetes services such as Docker Swarm or Dell/EMC's Pivotal Cloud Foundry.
- (324) Sixth, given the open source nature of container management infrastructure software, including Kubernetes, Docker Swarm, and Apache Mesos, "DIY" options whereby enterprises can download and develop/manage their own Kubernetes based container management solutions also provide a competitive constraint on paid-for container management providers.

#### 5.2.8.2. Commission's assessment

- (325) The Commission considers that, for the reasons set out below, the Transaction does not raise serious doubts as to its compatibility with the internal market on the potential market for Container Infrastructure Software as a result of horizontal non-coordinated effects.
- (326) First, the Commission considers that even on the basis of the market shares reported by IDC (see Table 17), the increment brought by the Transaction is small ([0-5]%). Furthermore, the Parties' market shares have been declining over the past three years, while the market for Container Infrastructure Software has been growing exponentially as evidenced by industry reports (see paragraph (321)).
- (327) The results of the market investigation also confirm that IBM's role in the Container Infrastructure Software space is small. According to customers: *"IBM's products in this space are not credible alternatives and do not represent*

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<sup>226</sup> According to the Notifying Party, In 2016, AWS' revenues grew by [...]%, Google by [...]%, Docker by [...]% and VMware by [...]%. See also IDC, *Worldwide Container Infrastructure Software Market Shares, 2017: Containers Poised for Growth*.

<sup>227</sup> The Notifying Party argues also that IBM Cloud Kubernetes Service does not directly compete against Red Hat OpenShift. IBM views its Kubernetes Service's main competitors as [...]. In those public cloud hosted services, the Kubernetes Service is usually deeply integrated with the cloud services but limiting the customer's portability of applications outside of the specific cloud. Red Hat's OpenShift offering, whether run by the customers or by Red Hat as a managed service, focuses on providing portability of the applications across the cloud providers. While both utilize the same core technology, the value provided to the customer is significantly differentiated. Red Hat's largest competitors in this area are companies that provide that same abstraction such as [...].

*meaningful competition” and “IBM today is not a major / largely relevant Kubernetes / Container Platform provider in the broader industry”.*<sup>228</sup>

- (328) Second, the results of the market investigation confirm that the Parties are not close competitors with regard to Container Infrastructure Software and there will remain sufficient alternative providers post-Transaction such as Docker, Dell/EMC’s Pivotal/VMware, Rancher, and Canonical, SUSE, AWS, Microsoft, Google.<sup>229</sup> As demonstrated at Table 17 above, these competitors entered the market for Container Infrastructure Software in 2016 and their market shares have been exponentially growing.
- (329) Customers and competitors expressed the view that this is a nascent market with many new competing offerings. This is confirmed by the market shares data set out in Table 17 above. Over the period 2016-2017, a number of strong competitors entered the market with their own Container Infrastructure Software offerings such as Docker, AWS, Google, VMware and their market shares have been consistently increasing. Therefore, these new entrants will continue to exert growing competitive pressure on the merged entity post-Transaction.
- (330) During the market investigation, customers expressed the views that *“this market is very active. New products and versions are coming from different providers”; “[the] market is developing, new alternatives are on the horizon”*. Customers also state that *“Container orchestration is a growing segment and there are more options in the market. Most of these options are based in Kubernetes”*.<sup>230</sup> According to a customer, *“[the company] has experienced this as an emerging and rapidly evolving market with a significant amount of competitors (with and without paid solutions/support)”*.<sup>231</sup>
- (331) With regard to Kubernetes-based Container Infrastructure Software, a customer considers that *“Red Hat OpenShift is one of the Kubernetes distributions. There will be a number of Kubernetes distributions available in the market post-Transaction”*. Another customer stated that *“Container technology is quickly evolving. Multiple vendors offer specific products in this area, both on premise and in the public cloud. Although there is dominant technology (Kubernetes) there is no dominant vendor”*.<sup>232</sup> A number of respondents to the market investigation also consider that technologies other than Kubernetes (such as Docker or Cloud Foundry) play an important role in the market for Container Infrastructure Software.<sup>233</sup>
- (332) Furthermore, a majority of customers and competitors that responded to the market investigation expressed the view that the Transaction will have a neutral impact on competition in the possible market for Container Infrastructure

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<sup>228</sup> See replies to Questionnaire Q2 to customers, question 35.

<sup>229</sup> See replies to Questionnaire Q2 to customers, questions 35, 36, 37.

<sup>230</sup> See replies to Questionnaire Q2 to customers, question 35.

<sup>231</sup> See replies to Questionnaire Q2 to customers, question 35.

<sup>232</sup> See replies to Questionnaire Q2 to customers, question 35.

<sup>233</sup> See replies to Questionnaire Q2 to customers, questions 35, 36, 37.



Software, while some customers and competitors consider that the impact of the Transaction will even be positive.<sup>234</sup>

- (333) A very small number of customers and competitors stated that the Transaction will have a negative impact on competition in the possible market for Container Infrastructure Software. A majority of these respondents do not further substantiate their claims. Some respondents point out that “Red Hat is the *de facto* standard in the industry for managed Kubernetes” or the offerings of competitors are “not that mature compared to Red Hat OpenShift”.<sup>235</sup>
- (334) In view of the above, the Commission considers that the merged entity will continue to face strong competitive constraints from alternative providers post-Transaction and competition on the possible market for Container Infrastructure Software will not decrease as a result of the Transaction.

### 5.2.9. Network Management Software

- (335) The market shares of the Parties and their competitors in the IDC segment for Network Management Software are presented in Tables 18-19.

**Table 18 – Network Management Software (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[10-20]%</b>	[...]	<b>[10-20]%</b>	[...]	<b>[10-20]%</b>
Solarwinds	[...]	[10-20]%	[...]	[10-20]%	[...]	[20-30]%
Nokia	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
CA Technologies	[...]	[10-20]%	[...]	[10-20]%	[...]	[5-10]%
Riverbed	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Micro Focus	-	-	[...]	[0-5]%	[...]	[0-5]%
Other	[...]	[40-50]%	[...]	[30-40]%	[...]	[30-40]%

Source: IDC

<sup>234</sup> See replies to Questionnaire Q2 to customers, question 60; Replies to Questionnaire 1 to competitors, question 67.

<sup>235</sup> See replies to Questionnaire Q2 to customers, questions 35 and 36.

**Table 19 – Network Management Software (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Solarwinds	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
CA Technologies	[...]	[10-20]%	[...]	[10-20]%	[...]	[5-10]%
Micro Focus	-	-	[...]	[0-5]%	[...]	[5-10]%
Nokia	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
InfoVista	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Other	[...]	[30-40]%	[...]	[20-30]%	[...]	[20-30]%

Source: IDC

### 5.2.9.1. Notifying Party's views

(336) The Notifying Party submits that the Transaction will unlikely to raise any unilateral effects concerns in the possible market for Network Management Software for the reasons set out below.<sup>236</sup>

(337) First, in the Notifying Party's view, the increment brought by the Transaction is negligible. The Transaction will result in a small increment below [0-5]% in the EEA in the possible market for Network Management Software.

(338) Second, the Notifying Party considers that the Parties' products are not close substitutes. According to the Notifying Party, IBM's and Red Hat's products are differentiated and complementary. IBM's product focuses on network performance management and monitoring, whereas Red Hat's product only provides network configuration management (and no monitoring at all).

(339) Third, the Notifying Party submits that a wide range of competitors will remain post-Transaction such as Solarwinds whose share in the EEA ([30-40]%) significantly exceeds the combined share of the Parties. According to the Notifying Party, other competitors include CA Technologies ([5-10]%), Hewlett Packard Enterprise ([0-5]%), Nokia ([0-5]%), and InfoVista ([0-5]%). In addition, the Notifying Party considers that barriers to entry are low, as evidenced by the high number of strong open source alternatives and new/expanding entrants, including, Groundwork Open Source, Hyperic HQ, Nagios, NetDirector, NetSNMP, OpenNMS, Snare, Zabbix, and Zenoss.

### 5.2.9.2. Commission's assessment

(340) The Commission considers that, for the reasons set out below, the Transaction does not raise serious doubts as to its compatibility with the internal market on the potential market for Network Management Software as a result of horizontal non-coordinated effects.

<sup>236</sup> See Form CO, paragraphs 683-691.

- (341) First, the increment brought by the Transaction is very small. As shown in Tables 19-20 above, the Transaction results in an increment of [0-5]% at the EEA-wide level.
- (342) Second, based on the Notifying Party's submission, the Commission considers that the Parties are not close competitors with regard to Network Management Software and there will remain sufficient alternative providers post-Transaction such as CA Technologies, HPE, Nokia and others.
- (343) Therefore, the Commission considers that the merged entity will continue to face strong competitive constraints from alternative providers post-Transaction and competition on the possible market for Network Management Software (and any possible sub-segment thereof) will not decrease as a result of the Transaction.

#### **5.2.10. Server Operating Systems**

- (344) Red Hat offers Red Hat Enterprise Linux ("RHEL"), a Linux distribution that accounts for some [...] % of Red Hat's overall revenues (in FY 2018). The RHEL source code is open source and therefore freely available; Red Hat instead charges for annual subscriptions that include technical support, updates, security, and IP protection. In FY 2018, Red Hat's RHEL revenues were USD [...] (EUR [...]), of which approximately USD [...] (EUR [...]) were generated in the EEA.
- (345) Red Hat also contributes to the CentOS community, which distributes a Linux distribution for developers based on RHEL and to the Fedora community which distributes a Linux distribution based on the latest technology from the Linux kernel community. Red Hat does not sell support subscriptions for CentOS or Fedora and derives no revenue from these activities.
- (346) IBM is a minor player in server operating systems. Its operating systems are proprietary and based on either Unix or IBM's own code base: z/OS, zVSE, zTPF, AIX, and IBM i. z/OS, zVSE, and zTPF run exclusively on IBM's z processors, while AIX and IBM i run exclusively on IBM's POWER processor architecture. Note however that IBM's System z and POWER System servers are also capable of running a variety of Linux distributions. Canonical, SUSE, and Red Hat have certified their operating systems (*i.e.*, Ubuntu, SUSE Enterprise Linux, and RHEL) for IBM's servers.
- (347) The market shares of the Parties and their competitors in the Gartner segment for All Operating Systems (paid only) are presented in Tables 20-21.<sup>237</sup>

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<sup>237</sup> There is no horizontally affected market on the basis of a possible market including both paid and unpaid Server Operating Systems. On such a market, the combined market shares of the Parties are [10-20]% for 2018 at the worldwide level (IBM: [0-5]%; Red Hat: [10-20]%).

**Table 20 – Server Operating Systems (paid only) (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Red Hat	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
<b>Combined</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>
Microsoft	[...]	[50-60]%	[...]	[50-60]%	[...]	[50-60]%
Oracle	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
HPE	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Micro Focus	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Fujitsu	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%

Source: Gartner

**Table 21 – Server Operating Systems (paid only) (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Red Hat	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
<b>Combined</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>
Microsoft	[...]	[50-60]%	[...]	[50-60]%	[...]	[50-60]%
Micro Focus	[...]	[0-5]%	[...]	[5-10]%	[...]	[0-5]%
HPE	[...]	[5-10]%	[...]	[5-10]%	[...]	[0-5]%
Oracle	[...]	[5-10]%	[...]	[0-5]%	[...]	[0-5]%
Canonical	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%

Source: Gartner

### 5.2.10.1. Notifying Party's views

(348) The Notifying Party submits that the Transaction is unlikely to raise any unilateral effects concerns in Server Operating Systems (“OS”) market (and any sub-segment thereof) for the reasons set out below.<sup>238</sup>

(349) First, the Notifying Party argues that while IBM’s proprietary servers are also capable of running a variety of Linux distributions, including RHEL, IBM server customers generally deploy Linux for different use cases than IBM’s own proprietary operating systems. As a result, even within IBM’s installed base, there is no meaningful competition between IBM and Red Hat in operating systems.

<sup>238</sup> See Form CO, paragraph 312.

(350) Second, the Notifying Party also refers to Gartner which reports separate segments for IBM's proprietary operating systems. According to the Notifying Party, this reflects the absence of overlap between the Parties' operating systems products.

#### **5.2.10.2. Commission's assessment**

(351) The Commission considers that the Transaction does not raise serious doubts as to its compatibility with the internal market in the market for Server Operating Systems (and any sub-segment thereof) as a result of horizontal non-coordinated effects.

(352) The Commission considers that IBM's proprietary OS and Red Hat's Linux distribution, i.e. RHEL, address different use cases and do not compete in any meaningful way. Based on the Notifying Party's submission, IBM is a de minimis vendor of proprietary server operating systems that run exclusively on IBM's z processors and IBM's POWER processor architecture. IBM's proprietary servers are also capable of running Linux distributions, which are nevertheless deployed for use with different applications. Therefore, even if only considering IBM's installed customer base, there does not appear to be any significant competitive interaction between Red Hat and IBM.

### **5.3. Vertical and conglomerate non-coordinated effects**

#### **5.3.1. Affected markets**

(353) Based on 2018 data, there are 18 IDC and/or Gartner market segments<sup>239</sup> in which the individual and/or combined market shares of the Parties exceed 30% at the worldwide and/or EEA level as described in Table 22 below.<sup>240</sup> Actually, in each market segment where the combined market shares exceed 30%, it is mainly due to a strong position of one of the Parties, which already pre-Transaction holds a market share above 30%. As indicated in this Table, in 15 of these segments it is IBM which has an individual market share in excess of 30%, and in 3 segments it is Red Hat.

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<sup>239</sup> In some cases both the IDC and the broadly corresponding Gartner segments are affected. In these cases we have kept the IDC denomination.

<sup>240</sup> Six of these 18 segments are also horizontally affected. They are indicated in *italic* in Table 17. The horizontal overlaps between the Parties on these segments are assessed in section 5.2 above.

**Table 22: Non-horizontally affected markets**

	<b>Application Development and Deployment</b>	<b>Party having market share &gt;30%</b>
1.	<i>Deployment-Centric Application Platforms</i> (IDC/G)	IBM
2.	Transaction Processing Monitors (IDC/G)	IBM
3.	<i>Event-Driven Middleware</i> (IDC/G)	IBM
4.	Managed File Transfer Software (IDC)	IBM
5.	<i>Business Process Management Suites</i> (G)	IBM
6.	Non-Relational Database Management (IDC/G)	IBM
<b>System Infrastructure Software</b>		
7.	AD Mainframe Tools (G)	IBM
8.	Storage Management Mainframe Software (G)	IBM
9.	<i>Container Infrastructure Software</i> (IDC)	Red Hat
10.	<i>Server Operating Systems</i> (paid only) (IDC)	Red Hat
11.	Paid Linux Operating systems (G)	Red Hat
12.	<i>Paid Unix and other OS</i> (G)	IBM
13.	Web Access Management Software (G)	IBM
14.	Security Information and Event Management (SIEM) (G)	IBM
15.	Security Testing (G)	IBM
16.	Other ITOM (i.e. IT operations management software other than ITOM Mainframe tools) (G)	IBM
<b>Hardware</b>		
17.	Mid-range servers (IDC/G)	IBM
18.	High-end servers (IDC/G)	IBM

Source: Form CO

- (354) Given the interrelated nature of all components in the IT stack, and the high number of products offered by both Parties in this stack,<sup>241</sup> there is potentially a very high number of closely related neighbouring markets<sup>242</sup> to the potential markets listed in Table 22 above. This is because many of the products within the IT stack are purchased by the same set of customers, either together or separately, and to some extent to perform complementary tasks with the aim of managing the same workloads.
- (355) For example, Red Hat’s OpenShift, is probably the best example of a Red Hat product that is compatible with the products offered by IBM and IBM’s competitors in different public clouds, private clouds and traditional enterprise stack environments, as OpenShift’s objective is to facilitate the movement of workloads between these three environments.

<sup>241</sup> IBM offers 438 software products falling into 62 IDC functional markets belonging to one of IDC primary markets for Application software, Application Development and Deployment Software or System Infrastructure Software (See Annex RFI Q.18(b)). Customers purchasing RHEL or Red Hat OpenShift (the two main Red Hat products for which Red Hat has a market share in excess of 30%) could potentially purchase any of these 438 IBM products for the same IT stack.

Similarly, Red Hat offers 46 different software products falling into 19 IDC functional markets belonging to one of IDC primary markets for Application software, Application Development and Deployment Software or System Infrastructure Software. Customers purchasing an IBM product belonging to one of the potential markets where IBM has a market share in excess of 30% could potentially purchase any of these 46 Red Hat products for the same IT stack.

<sup>242</sup> In the sense that products belonging to these markets may be purchased to some extent by the same set of customers for the same end use – their IT stack.

- (356) Given the potentially very high number of related neighbouring markets in the IT stack, it would be unrealistic to assess each non-horizontal link between any potential product market listed in Table 22 above and any neighboring market where one of the Parties is active.
- (357) Instead, in this decision, the Commission undertakes an overall assessment, first, whether the merged entity would have the ability to leverage a strong position in any of the potential markets listed in Table 22 into any other market(s) where one of the Parties is active, second, whether it would have the incentive to do so, and third, whether such a foreclosure strategy would have a significant detrimental effect on competition in those latter markets, thereby significantly impeding effective competition.<sup>243</sup> All three factors will be examined together as they are closely intertwined.<sup>244</sup> This assessment is done in turn for each market listed in Table 22.
- (358) Section 5.3.3 first looks at whether the merged entity would have the ability and incentive to leverage the potentially strong position of Red Hat Enterprise Linux in a market for server operating systems into neighbouring markets where IBM is active and thereby foreclose competitors. Section 5.3.4 carries out a similar assessment looking at the potentially strong position of Red Hat OpenShift in a market for container infrastructure.
- (359) Section 5.3.5 then looks at the server markets and evaluates whether the merged entity would have the ability and incentive to leverage the potentially strong position of IBM's Mainframe and Power servers into neighbouring markets where Red Hat is active. As the Commission heard concerns that IBM (through its role as global leader in IT services and IT consultancy) may substantially influence end customers' purchasing decisions for software products in favour of Red Hat products and to the detriment of competing vendors' products post-transaction, Section 5.3.6 assesses whether the merged entity would have the ability and incentive to leverage a potentially strong position of IBM in any IT services market into neighbouring markets where Red Hat is active. And finally, section 5.3.7 covers all the other non-horizontally affected markets where IBM has a market share in excess of 30% and evaluates whether the merged entity would have the ability and incentive to leverage the potentially strong position of IBM into neighbouring markets where Red Hat is active.
- (360) Before delving into the assessment for each potential market, section 5.3.2 first briefly describes the potential practices in the IT sector by way of which the Commission considered that the merged entity could potentially leverage its position in one market into another one.

### **5.3.2. *Potential theories of harm***

- (361) The Non-horizontal Merger Guidelines recognise that the main concern in the context of non-horizontal concentrations is that of foreclosure. In particular, the combination of products in related markets may confer on the merged entity the

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<sup>243</sup> Non-horizontal Merger Guidelines, paragraph 32.

<sup>244</sup> Non-horizontal Merger Guidelines, paragraph 32.

ability and incentive to leverage a strong market position from one market to another by means of tying or bundling or other exclusionary practices.<sup>245</sup>

- (362) In assessing the likelihood of conglomerate effects, the Commission examines, first, whether the merged firm would have the ability to foreclose its rivals, second, whether it would have the economic incentive to do so and, third, whether a foreclosure strategy would have a significant detrimental effect on competition. In practice, these factors are often examined together as they are closely intertwined.<sup>246</sup>
- (363) Mixed bundling refers to situations where the products are also available separately, but the sum of the stand-alone prices is higher than the bundled prices.<sup>247</sup> Tying refers to situations where customers that purchase one good (the tying good) are required also to purchase another good from the producer (the tied good). Tying can take place on a technical or contractual basis.<sup>248</sup> Tying and bundling as such are common practices that often have no anticompetitive consequences. Nevertheless, in certain circumstances, these practices may lead to a reduction in actual or potential rivals' ability or incentive to compete. Foreclosure may also take more subtle forms, such as the degradation of the quality of the standalone product.<sup>249</sup> This may reduce the competitive pressure on the merged entity allowing it to increase prices.<sup>250</sup>
- (364) In order to be able to foreclose competitors, the merged entity must have a significant degree of market power, which does not necessarily amount to dominance, in one of the markets concerned. The effects of bundling or tying can only be expected to be substantial when at least one of the merging parties' products is viewed by many customers as particularly important and there are few relevant alternative for that product.<sup>251</sup> Further, for foreclosure to be a potential concern, it must be the case that there is a large common pool of customers, which is more likely to be the case when the products are complementary.<sup>252</sup>
- (365) The incentive to foreclose rivals through bundling or tying depends on the degree to which this strategy is profitable.<sup>253</sup> Bundling and tying may entail losses or foregone revenues for the merged entity.<sup>254</sup> It may also increase profits by gaining market power in the tied goods market, protecting market power in the tying good market, or a combination of the two.<sup>255</sup>
- (366) It is only when a sufficiently large fraction of market output is affected by foreclosure resulting from the concentration that the concentration may significantly impede effective competition. If there remain effective single-

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<sup>245</sup> Non-horizontal Merger Guidelines, paragraph 93.

<sup>246</sup> Non-horizontal Merger Guidelines, paragraph 94.

<sup>247</sup> Non-horizontal Merger Guidelines, paragraph 96.

<sup>248</sup> Non-horizontal Merger Guidelines, paragraph 97.

<sup>249</sup> Non-horizontal Merger Guidelines, paragraph 33.

<sup>250</sup> Non-horizontal Merger Guidelines, paragraph 93.

<sup>251</sup> Non-horizontal Merger Guidelines, paragraph 99.

<sup>252</sup> Non-horizontal Merger Guidelines, paragraph 100.

<sup>253</sup> Non-horizontal Merger Guidelines, paragraph 105.

<sup>254</sup> Non-horizontal Merger Guidelines, paragraph 106.

<sup>255</sup> Non-horizontal Merger Guidelines, paragraph 108.



product players in either market, competition is unlikely to deteriorate following a conglomerate concentration.<sup>256</sup> The effect on competition needs to be assessed in light of countervailing factors such as the presence of countervailing buyer power or the likelihood that entry would maintain effective competition in the upstream or downstream markets.<sup>257</sup>

- (367) The Commission considered in particular two practices by way of which the merged entity could potentially leverage a strong market position in one market into another one and foreclose competitors in the latter.
- (368) Anticompetitive (mixed) bundling or tying. The merged entity could for instance attempt to reduce its competitors' ability to compete by offering a strong IBM or Red Hat product in one of the markets listed in Table 22, combined with one of the other Party's products at a bundled price lower than the sum of the standalone prices. This could potentially lead to the anticompetitive marginalization of rivals selling stand-alone components (*i.e.*, nonintegrated rivals) competing with the other Party's product and to consumer harm, if the bundled offer was not replicable and the bundling strategy diverted sufficient demand from non-integrated rivals to make them unable to compete effectively. Degradation of interoperability. The merged entity could in theory selectively improve the interoperability between IBM and Red Hat products, while degrading the interoperability of the merged entity's products with third party products. This relative degradation of interoperability could for instance take the form of a refusal by the merged entity to certify one of its strong products in one of the markets listed in Table 22 when combined with third party hardware or software, whereas it would be certified to run with the competing IBM/Red Hat product. Certification is a common practice by which a vendor certifies its ability and willingness to fully support its product when combined with another product. Non-certification does not mean that the products will not be interoperable, just that full support would not be guaranteed unconditionally, in particular when the non-certified product is suspected to be the cause of the issue. If the merged entity has a significant degree of market power with the product that it selectively refuses to certify with a third party product, if there is a large common pool of customers for the individual products, and if cross-certification is an important consideration for customers, then such selective refusal to certify may potentially allow the merged entity to foreclose competitors.<sup>258</sup>

### **5.3.3. Server Operating Systems – Leveraging the potentially strong position of Red Hat Enterprise Linux into neighbouring markets where IBM is active**

#### **5.3.3.1. Potential concern**

- (369) The Commission has assessed a potential competition concern whereby the merged entity would leverage RHEL's potentially strong position in a plausible market for paid Linux server operating systems, into any other market(s) where

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<sup>256</sup> Non-horizontal Merger Guidelines, paragraph 113.

<sup>257</sup> Non-horizontal Merger Guidelines, paragraph 114.

<sup>258</sup> During the pre-notification phase the Commission received two complaints based on such a scenario. However, as these complaints relate to a current refusal to certify Red Hat Enterprise Linux ("RHEL") when combined with third party products competing with Red Hat, these complaints largely relate to ongoing commercial disputes rather than to merger specific concerns.

IBM is active and thereby foreclose competitors, by means of one of the practices described in section 5.3.2.

- (370) In particular, some competitors have suggested that the merged entity may try to leverage RHEL into (1) IBM's servers, (2) IBM's application software and (3) IBM's cloud solutions (including public and private cloud).<sup>259-260</sup>
- (371) In addition, Nutanix – a cloud computing software company – put forward a related complaint. According to Nutanix, Red Hat is already attempting to leverage the strong position of RHEL, by refusing to certify competing open source hypervisors such as Nutanix's AHV and by denying support to RHEL customers who operate non-certified hypervisors. According to Nutanix, Nutanix's open-source KVM-based Acropolis Hypervisor ("AHV") competes directly with Red Hat's open source KVM-based hypervisor solution ("RHV" or Red Hat Virtualization).
- (372) Nutanix however acknowledged that this foreclosure strategy has so far only been partially implemented since powerful customers have been able to compel Red Hat to certify Nutanix's products to run on RHEL on an ad hoc basis.
- (373) According to Nutanix, the Transaction will increase the merged entity's ability and incentive to foreclose its competitors in a market for open source hypervisors. This is because, post-Transaction, the merged entity will not only leverage its control over the certification process of Nutanix's hypervisor (in combination with RHEL), but will also leverage its allegedly strong position in the provision of IT services and hardware, to steer customers to Red Hat's own hypervisor, and away from non-certified open source hypervisors.<sup>261</sup> However, the core of Nutanix's complaint is about Red Hat refusing to certify competing open source hypervisors such as Nutanix's AHV and denying support to RHEL customers who operate non-certified hypervisors. The claim by Nutanix that the merged entity would also leverage its allegedly strong position in the provision of IT services and hardware was added by Nutanix in a second stage in an effort to make its complaint merger specific.<sup>262</sup>

#### 5.3.3.2. Notifying Party's view

- (374) The Notifying Party submits that the merged entity will not have the ability and incentive to leverage RHEL's potentially strong market position to boost IBM's sales and foreclose IBM's competitors in neighbouring markets, for the following reasons.

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<sup>259</sup> See replies to Questionnaire Q1 to competitors, questions 41 and 42. See also further submission by Oracle, dated 5 June 2019, in which it claims that the Transaction will increase both the ability and incentive of the merged entity to leverage Red Hat's position in the enterprise Linux market to strengthen the merged entity's position in the cloud infrastructure space.

<sup>260</sup> Only IBM has meaningful cloud service activities and its corresponding share of sales are very small (<[5-10]% for Infrastructure-as-a-Service ("IaaS"), <[0-5]% for Platform-as-a-Service ("PaaS"), and <[0-5]% for Software-as-a-Service ("SaaS")). IaaS can comprise either a public or private cloud infrastructure provided as a service (on a pay-as-you-go model). See Form CO, paragraph 296.

<sup>261</sup> See Submission of Nutanix, Inc. dated 3 April 2019 and Responses from Nutanix dated 24 April 2019 to Commission's questions of 9 April 2019.

<sup>262</sup> This is also apparent from the fact that the remedy advocated by Nutanix is that the merged entity commits to certify Nutanix's AHV for use with RHEL.

*As regards ability*

- (375) The Notifying Party argues that the merged entity will not have the ability to foreclose rivals by leveraging Red Hat's position in server operating systems because Red Hat does not have sufficient market power in the market for server operating system, for the following reasons.
- (376) In the first place, as explained in section 4.3.10 above, the Notifying Party considers that the relevant product market for operating systems should encompass all server operating systems, *i.e.*, Windows (server), Linux, Unix, including any "descendants" thereof, such as Solaris, HP-UX and AIX, and other proprietary operating systems, such as IBM i, z/OS, and z/VSE. This product market definition is consistent with the IDC submarket for Core Operating Systems (*i.e.*, server operating systems) as well as the Commission's decisional practice.<sup>263</sup> In such market, RHEL only represented [10-20]% of new server OS deployments in 2017 (*i.e.* volume market shares), Windows Server [30-40]%, unpaid Linux [30-40]%, SUSE [5-10]%.<sup>264</sup> Even when excluding unpaid deployments, Red Hat had a market share of only [30-40]% in 2017. In terms of revenue (and therefore excluding free unsupported operating systems), based on Gartner, Red Hat had a market share of [10-20]% in 2018, whereas Microsoft had a market share of [50-60]%, Oracle [0-5]%, HPE [0-5]%, etc.
- (377) In the second place, the Notifying Party argues, that even when considering only paid Linux distributions, RHEL faces strong competition from SUSE, Canonical (Ubuntu), Oracle Linux, and Amazon Linux.<sup>265</sup>
- (378) In the third place, according to the Notifying Party, credible alternatives are particularly numerous in case of cloud deployments, as each public cloud platform offers several different (free and paid) alternatives to RHEL. Amazon and Oracle actually offer and support their own Linux distributions. These alternatives are close and supported substitutes to RHEL, as they are based on RHEL, and are generally offered at no additional cost to customers beyond computing time. Existing customers would likely switch to these native offerings in the event of practices unduly favoring IBM products in combination with RHEL, thus denying IBM the ability to foreclose competitors. For example, a customer that currently runs RHEL on an IBM rival's public cloud could start using one of the many available alternatives to RHEL if IBM were to increase the price of RHEL sold through that IBM rival's public cloud to try and favor its own public cloud offering.
- (379) In the fourth place, the Notifying Party claims that Red Hat's market power is further limited by the fact that RHEL is open source and therefore can be forked, *i.e.*, a company may choose to take the open source code and develop it with community support under a different distribution.<sup>266</sup>

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<sup>263</sup> See Form CO, paragraph 704.

<sup>264</sup> IDC, *Worldwide Server Operating Environments Market Shares, 2017: Linux Fuels Market Growth* (2018)

<sup>265</sup> See Form CO, paragraph 885.

<sup>266</sup> See Form CO, paragraph 847.

*As regards incentives*

- (380) According to the Notifying Party, the merged entity would also not have the incentive to degrade RHEL's interoperability (whether by changing RHEL's source code or by refusing to certify RHEL) or to raise RHEL's relative price when combined with third party products competing with IBM.
- (381) First, according to the Notifying Party, this is because customers value choice and the ability to mix and match capabilities at each level of the IT stack that best match the compute and functional requirements of specific workloads (which very much diverges from one customer to another). As, according to the Notifying Party, there are credible competing alternatives to RHEL to which customers may turn, the merged entity would be more likely to lose sales of RHEL than to gain additional sales of the other product. This is even more so that often system integrators are involved to help satisfying the heterogenous needs of their customers.<sup>267</sup>
- (382) Second, the incentive to engage in any anticompetitive exclusionary practices would be further reduced because, according to the Notifying Party, such practices would be perceived as hostile by Red Hat's customers, developer community, and ecosystem partners, and would therefore alienate them. As Red Hat's success relies both on the support of developers and the ecosystem partners (to be able to sell in a wide ecosystem), [...].<sup>268</sup>

*As regards the Nutanix complaint in particular*

- (383) The merged entity argues that neither Red Hat nor the merged entity has or will have the ability or the incentive to foreclose third-party hypervisors, for the following reasons.<sup>269</sup>
- (384) First, the Notifying Party argues that certification is **not** a prerequisite or requirement for interoperability, and as a result cannot be used to foreclose competitors. Certification is just an expression by a commercial vendor that it is willing to support its products when used in combination with certain, identified other products
- (385) Second, the Notifying Party argues that its pre-merger choice not to certify certain third parties hypervisors, including Nutanix's AHV is not motivated by an anticompetitive objective to foreclose competitors but is driven by legitimate business considerations. In particular, Red Hat has so far decided not to certify Nutanix because [...].

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<sup>267</sup> In particular, the Notifying Party explains that it would have no incentive to degrade RHEL's interoperability with, or raise the relative price of RHEL sold through its public cloud rivals, to boost its own public cloud offering because diversion at the cloud environment level would likely be small relative to diversion between operating systems within the same cloud environment. This is because switching between Linux distributions within the same cloud environment is easier than switching cloud environments. See Form CO, paragraphs 886-888.

<sup>268</sup> See Form CO, paragraph 848.

<sup>269</sup> See Notifying Party's response to submission by Nutanix, Inc. to the European Commission, 3 May 2019.

- (386) Third, the Notifying Party argues that Red Hat does not have the ability to foreclose third-party hypervisors, as it has no market power in server operating systems (see above).
- (387) Fourth, the Notifying Party argues that the mere fact that Red Hat's market share in an overall market for virtualisation software is below [0-5]%, shows that Red Hat has neither the ability nor the incentive to foreclose competition in hypervisors.<sup>270</sup> The Notifying Party further argues that it is not appropriate to further segment virtualisation software into proprietary and supported open source virtualisation software, as argued by Nutanix.
- (388) In fact, the Notifying Party explains that Red Hat certifies all the most important competing hypervisors VMware ESX and ESXi, Microsoft Hyper-V, and Google's and AWS's enclosed KVM-based hypervisors, showing that it has no incentive to foreclose competing hypervisors. According to the Notifying Party, together Microsoft Hyper-V and VMware ESX and ESXi account for more than [90-100]% of the hypervisors used. In contrast, AHV has a very small presence on premises or in clouds (estimated to less than [0-5]% by Red Hat), and given [...], Red Hat has so far decided not to certify AHV.
- (389) Fifth, the Notifying Party claims that just as Red Hat lacks the ability to use RHEL as a lever to foreclose competitors today, IBM will lack such ability to do so post-Transaction, as IBM has less than [10-20]% market share in any possible IT services market.

### 5.3.3.3. Commission's assessment

#### *As regards the general theory of harm*

- (390) The Commission considers that the merged entity will most likely not have the ability to foreclose competition in other markets by leveraging RHEL's potentially strong position in a plausible market for paid Linux server operating systems, into any other market(s) where IBM is active and thereby foreclose competitors, by means of one of the practices described in section 5.3.2.. Moreover the Commission considers that the merged entity will also most likely not have the incentive to engage in any exclusionary practice. Therefore, it is unnecessary to assess in more detail whether such foreclosure strategy would have a significant detrimental effect on competition.

#### *As regards ability*

- (391) First, the Commission considers that Red Hat most likely does not have a sufficient degree of market power to leverage its position with RHEL to foreclose competitors in other markets. Although it can be left open whether the market for server operating system would have to be further segmented between paid supported and unpaid unsupported and between families, the Commission

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<sup>270</sup> See Form CO, paragraphs 269-294. The Notifying Party explained that hypervisors only refer to the core technology enabling virtualization, and software vendors today no longer sell hypervisors alone but virtualization solutions that include host OS and management functions. Therefore, the Parties refer to virtualization software instead of hypervisors. For market shares, see IDC Worldwide Virtual Machine Software Market Shares, 2017: Virtualization Still Showing Positive Growth and Gartner Enterprise Infrastructure Software Market Share Tracker (Worldwide 2017).

assessed Red Hat's market power and ability to leverage its position within the narrowest segment, i.e. a market for paid Linux-based server operating systems.

- (392) In a worldwide market for paid Linux-based server operating systems, Red Hat's market share exceeds [70-80]% according to Gartner (see Table 23 below). It however faces competition from at least 3 main rival paid Linux distributions, i.e. SUSE with [10-20]% market share (which was owned by Micro Focus until mid 2018), Oracle [5-10]% and Canonical [5-10]%.<sup>271</sup> At an EEA level (see Table 24 below), Red Hat's market share is [60-70]% according to Gartner, with SUSE's and Canonical's market share being significantly higher than worldwide, at respectively [10-20]% and [5-10]%.

**Table 23: Market shares in paid Linux-based server operating systems, (worldwide 2016-2018)**

	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	-	-	-	-	-	-
Red Hat	[...]	[70-80]%	[...]	[70-80]%	[...]	[70-80]%
<b>Combined</b>	[...]	[70-80]%	[...]	[70-80]%	[...]	[70-80]%
Micro Focus International <i>272</i>	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Oracle	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Canonical	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

<sup>271</sup> According to IDC data, Red Hat's market share in 2017 was [70-80]% (IDC 2018 data was not available for Paid Linux-based server operating systems at the moment of notification). The Commission asked revenue data from IBM, Red Hat and their main competitors in operating systems to assess the reliability of Gartner and IDC data. On this basis, it carried out a market reconstruction, which confirmed a market share for Red Hat comprised between 70% and 80%.

<sup>272</sup> In July 2018, Micro Focus sold SUSE to EQT Partners. In this table SUSE's revenue is attributed to Micro Focus International.

**Table 24: Market shares in paid Linux-based server operating systems, (EEA 2016-2018)**

	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	-	-	-	-	-	-
Red Hat	[...]	[50-60]%	[...]	[60-70]%	[...]	[60-70]%
<b>Combined</b>	[...]	<b>[50-60]%</b>	[...]	<b>[60-70]%</b>	[...]	<b>[60-70]%</b>
Micro Focus International 273	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Canonical	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Oracle	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Others	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

- (393) The results of the market investigation indicate that the vast majority of customers consider that there are sufficient alternatives to RHEL on the market; SUSE, SLES, Canonical's Ubuntu and Oracle's Oracle Linux being the most cited alternatives. In addition, depending on the type of workload, some customers also listed free Linux distributions as credible alternatives, such as Debian and CentOS, or Amazon Linux for cloud deployment, and some considered Microsoft Windows as an alternative.<sup>274</sup>
- (394) The Commission notes that in an overall market for server operating systems, Red Hat's market share would not raise any suspicion of market power. In this overall market, Red Hat only accounted for [10-20]% of all new server OS deployments in 2017, with Microsoft accounting for [30-40]% and unpaid Linux [30-40]%. Considering only paid server operating systems ("OS"), Red Hat accounted for [30-40]% of all new paid server OS deployments in 2017, against [50-60]% for Microsoft. Instead, if only Linux server operating systems are considered, IDC reports that in paid and nonpaid Linux deployments, Red Hat's share for 2017 was only [20-30]%.<sup>275</sup>
- (395) In further support of the fact that Red Hat most likely does not have sufficient market power with RHEL to leverage into other markets, the Commission notes that RHEL's strong market position has apparently not placed it in a position to meaningfully grow its sales of other Red Hat products despite the fact that all customers of RHEL may potentially buy other Red Hat product, let alone exclude competitors. Indeed, Red Hat's share of sales for these other products (based on IDC and/or Gartner) is typically low or very low (below [10-20]% with the exception of the plausible market for container infrastructure software where Red Hat's market share is [30-40]%). This is despite the fact that there is presumably a

<sup>273</sup> *Ibid.*

<sup>274</sup> See replies to Questionnaire Q2 to customers, question 40

<sup>275</sup> IDC, Worldwide Server Operating Environments Market Shares, 2017: Linux Fuels Market Growth (2018). This is equivalent to Red Hat's share of total worldwide paid and nonpaid server OS deployments relative to the portion of these that is paid and nonpaid Linux subscriptions, i.e., [10-20]%/[60-70]% = [20-30]%.  
<sup>276</sup> *Ibid.*

very large common pool of customers between Red Hat other products and RHEL (most likely larger in terms of proportion than between IBM products and RHEL), which increases the potential for mixed bundling or degradation of interoperability to affect the demand for individual products.

- (396) According to IDC, with the exception of the plausible market for paid Linux server operating system, Red Hat's market share is the highest in container infrastructure software. However, even in this plausible market, Red Hat only had a market share of [30-40]% in 2017, in decline from its 2015 level of [60-70]%. This is despite the fact that according to a number of competitors, Red Hat already attempts to leverage its position with RHEL to advantage its own container infrastructure software, i.e. OpenShift. For instance Oracle explains that Red Hat "*limits support when customers do not run RHEL with OpenShift in order to favour its own container technology*".<sup>276</sup> The Commission considers that the strongly declining market share of OpenShift and the very low market shares of Red Hat's other products is indicative of Red Hat's lack of market power in operating systems to influence demand in neighbouring markets in favour of its own products.
- (397) Second, the results of the market investigation show that only very few customers representing a very small minority considered that the merged entity may have the ability to leverage RHEL's market position into another market where IBM is active.<sup>277</sup>
- (398) Third, as regards specifically the potential concern that the merged entity may want to leverage the strong position of RHEL in paid Linux distributions into IBM's cloud solutions (including public and private cloud), by degrading RHEL's interoperability with, or raise the relative price of RHEL sold through its cloud rivals, the Commission considers that the merged entity would not have the ability to significantly foreclose competitors in any cloud services market.
- (399) In the first place, cloud customers would have the option to use alternative Linux distributions with their preferred cloud providers as each public cloud platform offers several different (free and paid) alternatives to RHEL. For instance, Microsoft offers eight supported Linux distributions on Azure, but customers can also build or upload other Linux versions;<sup>278</sup> AWS offers seven supported Linux distributions;<sup>279</sup> Google Cloud platform offers seven supported Linux distributions.<sup>280</sup> This includes their own free alternatives (offered at no additional cost to customers beyond computing time), which are increasingly being adopted. Amazon and Oracle offer and support their own Linux distributions based on RHEL. Google is known for using a derivative of Debian Linux. Azure uses an Ubuntu derivative. Red Hat expects that [...], and with that will come the further growth of the public clouds' own free Linux distributions. The Commission therefore considers that existing cloud customers would have sufficient alternatives to switch to in the event of a relative price increase of RHEL on their cloud platform, a refusal to certify RHEL or any other degradation of

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<sup>276</sup> See Minutes of the call with Oracle of 9 April 2019.

<sup>277</sup> See replies to Questionnaire Q2 to customers, question 42.

<sup>278</sup> <https://docs.microsoft.com/en-us/azure/virtual-machines/linux/endorsed-distros>

<sup>279</sup> <https://aws.amazon.com/fr/mp/linux/>

<sup>280</sup> <https://cloud.google.com/compute/docs/images#os-details>



interoperability. This would significantly limit the ability of the merged entity to foreclose competitors.

- (400) In the second place, the Commission notes that switching between cloud environments can be difficult, limiting further the ability of the merged entity to leverage RHEL to foreclose its cloud competitors. For example, many public cloud providers impose large switching costs, such as by charging for data mobility.<sup>281</sup>

*As regards incentives*

- (401) First, the Commission acknowledges that IBM has made firm, public commitments to maintain and continue Red Hat's open source business model and its neutral "Switzerland" strategy in working with third parties. Virginia Rometty, IBM's Chairman and Chief Executive Officer, made clear her view that IBM must "preserve absolutely" Red Hat's position as a neutral Switzerland with respect to third party partners.<sup>282</sup> IBM expressly included this commitment in the Agreement and Plan of Merger (the "Agreement"). In the Recitals of the Agreement, IBM agreed to operate Red Hat as a distinct business unit and that Red Hat would "*remain an open and neutral platform, partnering broadly with information technology participants [...] and continuing to support the open source community.*"<sup>283</sup> And this is actually in line with IBM's intent as stated in its internal documents. As reflected in IBM's internal documents, IBM's business case for the Transaction assumes that RHEL's sales will grow. This requires maintenance of Red Hat's neutral and open status, and its existing business model.<sup>284</sup>
- (402) Second, although the Commission acknowledges that efforts are required to switch from one Linux OS to another one, the Commission considers that switching is feasible. This view is confirmed by the results of the market investigation. Even if most customers consider that switching from one Linux OS to another would not be easy or may even be very difficult, many customers

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<sup>281</sup> See study carried out for the European Commission by IDC and Arthur's Legal entitled "*Switching of Cloud Services Providers*" available at <https://publications.europa.eu/en/publication-detail/-/publication/898aeca7-647e-11e8-ab9c-01aa75ed71a1>. Note that as stated in its Communication on ICT standardisation priorities for the Digital Single Market ("DSM", April 2016), it is the Commission's intention to promote the interoperability and data portability among cloud providers through facilitating the use of open source and the promotion of new cloud standards. Furthermore, since December 2017, the Commission established the DSM cloud stakeholders platform in order to facilitate the discussion among cloud stakeholders on technical and policy related aspects. Currently, in the context of the Regulation on the free flow of non-personal data (see <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018R1807>), the DSM cloud stakeholders working group on data porting and switching of providers (SWIPO) is developing Codes of Conduct on data porting, with the purpose of facilitating the switching between cloud service providers.

<sup>282</sup> See e.g., Seeking Alpha, *International Business Machines Corp. (IBM) CEO Ginni Rometty on Acquisition of Red Hat (Transcript)*, October 29, 2018, <https://seekingalpha.com/article/4215572-international-business-machines-corp-ibm-ceo-ginni-romettyacquisition-red-hat-transcript>. See also see also CNBC, *IBM CEO Ginni Rometty insists the 63% premium the tech giant is paying for Red Hat is a 'fair price'*, October 29, 2018, <https://www.cnbc.com/2018/10/29/ibm-ceo-ginnirometty-63percent-premium-for-red-hat-is-a-fair-price.html>

<sup>283</sup> See the Agreement and Plan of Merger by and among International Business Machines Corporation, Socrates Acquisition Corp. and Red Hat, Inc. dated October 28, 2018.

<sup>284</sup> See e.g. [...]

however explain that it is feasible and some state that they would consider it on a case by case basis assessing costs and benefits of doing so.<sup>285</sup>

- (403) As explained by the Notifying Party, “*for enterprise-grade workloads, any change of server OS requires retesting of applications in full, and may require the reinstallation of applications, including potential modifications, as well as potential recertification. [...] changing between different versions of Linux is simpler than changing between Windows and Linux, but some adjustments are required. This is also true for Oracle Linux, which is based on RHEL, but is not an exact clone of it.*”<sup>286</sup> However, as explained by the Notifying Party, “[w]hile switching existing workloads from one Linux OS to another always requires some level of effort in terms of application reinstallation and testing, switching does routinely occur”. According to the Notifying Party, examples of customers switching existing and new workloads from RHEL to SUSE include [...]. Similarly, several customers including [...] have migrated from RHEL to a Canonical OpenStack environment and have decided to run OpenStack on top of Ubuntu.<sup>287</sup>
- (404) Actually, when asked how they would react if as a result of the Transaction the merged entity were to non longer certify RHEL in combination with competing products at the infrastructure layer of the stack, only a small minority of customers claimed that they would continue using RHEL, but switch to the IBM/Red Hat alternative that is fully supported. A larger proportion of customers declared that they would switch to an alternative Linux distribution. A large customer for instance explains that “[t]here are viable alternatives to Red Hat Linux, including Debian and Ubuntu, that would enable us to reduce our dependency on IBM/Red Hat”. Some customers even indicated that they already switched in the past to alternative Linux OS because Red Hat did not certify elements of the IT stack for which they had a strong preference. Another large customer for instance explains: “*We have already switched our Linux OS where necessary to provide a fully supported stack, e.g., Oracle DB on Oracle Linux hosted on Oracle VM hypervisor*”<sup>288</sup>
- (405) Third, in line with the Parties argument, the Commission acknowledges that the merged entity will at least to some extent continue to be disciplined by the open source community of developers and by Red Hat’s ecosystem of partners. Significantly reducing the neutrality of RHEL would most likely be perceived as hostile by Red Hat’s developer community, and ecosystem partners. As Red Hat’s success relies both on the support of developers and the ecosystem partners (to be able to sell in a wide ecosystem), such practices may undermine one of the very rationale of the Transaction which is to grow Red Hat’s business. Since many of Red Hat’s key employees have chosen to work there precisely because of Red Hat’s neutral open source approach, any practice that would reduce the neutrality of Red Hat in favour of IBM product may also risk an exodus of key leadership, talent, and skills. The risks of [...].

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<sup>285</sup> See replies to Questionnaire Q2 to customers, questions 41 and 44.

<sup>286</sup> See the Notifying Party’s response to the Commission’s RFI 19, question 2.

<sup>287</sup> *Ibid.*

<sup>288</sup> See replies to Questionnaire Q2 to customers, question 46

- (406) This is also confirmed by some customers. Although certification of RHEL is acknowledged by many customers to be an important factor when considering the purchase of software/hardware/cloud services at other levels of the IT stack, only very few customers consider that the merged entity may have the incentive to limit certification of third party software, hardware, services and/or cloud service providers to perform with RHEL. According to some customers, this would alienate the open source community. As explained by a customer, *“One of the major benefits that IBM can expect from this acquisition is the position of Red Hat in the open source community. Adopting such a behaviour would generate very negative reactions from the open source community, and from other commercial editors who develop solutions which will be deployed on RHEL”*.<sup>289</sup> According to some others, this would reduce the attractiveness of RHEL, leading to customers eventually switching to alternative Linux distributions.
- (407) Fourth, and more generally, the vast majority of customers that responded to the market investigation indicated that the merged entity would not have the incentive to leverage RHEL’s market position into another market where IBM is active.<sup>290</sup>
- (408) Fifth, as regards specifically the potential concern that the merged entity may want to leverage the strong position of RHEL in paid Linux distributions into IBM’s cloud solutions (including public and private cloud), the Commission considers that the merged entity would not have the incentive to restrict RHEL’s availability to its own cloud, to refuse certification of third party cloud service providers or to disadvantage third party cloud providers commercially, for the following reasons.
- (409) In the first place, the wide choice of Linux distributions on competing cloud platforms and the difficulty to switch between cloud environments (see above) would limit the merged entity’s incentive to disadvantage RHEL’s deployment on third party cloud platforms.
- (410) In the second place, none of IBM’s three main competitors in public cloud services ([...]) raised any such concern. Only a fourth competitor, [...], raised the concern that the Transaction will increase both the ability and incentive of the merged entity to leverage Red Hat’s position in the enterprise Linux market to strengthen the merged entity’s position in the cloud infrastructure space.<sup>291</sup>
- (411) In fact, according to Microsoft, *“IBM likely does not have the incentive to materially restrict RHEL’s availability to its own cloud, IBM Cloud. Red Hat is an open source company with a very strong reputation in the open source community. If IBM were to restrict RHEL to IBM Cloud, it would materially harm Red Hat’s reputation as an open source software provider, which would make customers less likely to use RHEL and other Red Hat products, harming the value of the transaction. And because RHEL is an open source solution, aggrieved open source community members could fork RHEL and create their own version.”*<sup>292</sup>

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<sup>289</sup> See replies to Questionnaire Q2 to customers, question 43-45

<sup>290</sup> See replies to Questionnaire Q2 to customers, question 42

<sup>291</sup> See further submission by Oracle, dated 5 June 2019

<sup>292</sup> Microsoft’s further information responsive to Questionnaire Q1 to competitors, submitted on 24 May 2019.

- (412) In the third place, [...]. Actually, the Notifying Party explained to the Commission that [...].<sup>293</sup>
- (413) The Notifying Party further explained that the Agreement and Plan of Merger between IBM and Red Hat provides that IBM's consent is needed for amendment of Material Contracts. [...].<sup>294</sup>

*As regards the Nutanix complaint in particular*

- (414) Overall, the Commission considers that the merged entity will most likely not have the ability and incentive to foreclose competing hypervisor or virtualisation software for the following reasons.<sup>295</sup>
- (415) First, as regards Red Hat's motivation for not certifying Nutanix's AHV, the Commission notes that Red Hat is not the only Linux distributor which has not certified AHV to run their Linux operating system. For instance, Oracle explained that "*Nutanix's hypervisor AHV is not formally certified by Oracle to run Oracle Linux, though [...] Oracle supports other third party open source hypervisors, e.g. Ubuntu*".<sup>296</sup> This suggests that as explained by the Notifying Party, there may be legitimate business considerations for both Oracle and Red Hat not certifying AHV.
- (416) The Commission also notes that Red Hat certifies the most widely used competing hypervisors, including VMware ESX and ESXi and Microsoft Hyper-V, which account for [90-100]% of hypervisors used.<sup>297</sup> This strongly suggests that Red Hat is not motivated by a desire to foreclose competition, but rather by legitimate commercial considerations, unless proprietary hypervisors were not part of the same relevant market as open source hypervisors. If proprietary hypervisors are part of the same relevant market as Red Hat's open-source hypervisor RHV, then Red Hat would anyway still continue to face competition from its largest competitors representing around [90-100]% of the market.

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<sup>293</sup> See Notifying Party's response to question 1 of Commission RFI 21

<sup>294</sup> *Ibid.*

<sup>295</sup> The Commission however does not agree with the Notifying Party that a refusal to certify cannot be used to foreclose competitors. Although the Commission acknowledges that non-certification does not equate to non-interoperability, the Commission considers that, at least in certain cases where certification is an important factor in the choice of customers, a refusal to certify is equivalent to a degradation of interoperability which may potentially in certain conditions be used to foreclose competitors. As regards hypervisors, the market investigation shows that the vast majority of customers would not consider purchasing a hypervisor to run RHEL if it is not certified by Red Hat (See replies to Questionnaire Q2 to customers, question 52). Customers generally explain that they need support and that it is too risky to run uncertified hypervisors. Even Red Hat itself recommends not to use uncertified hypervisors, as this "introduces significant risk to customer environments". See also <https://access.redhat.com/third-party-software-support> where Red Hat states: "Using Red Hat products on uncertified hardware, hypervisors, or providers is unsupported. Using Red Hat software in an unsupported configuration introduces significant risk to customer environments and should be avoided [...]". Therefore, if customers were not willing to switch to alternative Linux distributions (or other operating systems), the Commission considers that a refusal to certify would potentially constitute an effective way to foreclose competing hypervisors.

<sup>296</sup> See Minutes of the call with Oracle of 7 June 2019.

<sup>297</sup> See Notifying Party's response to submission by Nutanix, Inc. to the European Commission, 3 May 2019.

- (417) On this point, the results of the market investigation strongly suggest that proprietary and open source hypervisors are part of the same market. The vast majority of competitors considered that competition between proprietary hypervisors and open source hypervisors is either strong or very strong.<sup>298</sup> The majority of customers expressing a view on the question also indicated that when considering the purchase of a hypervisor for running virtual machines, they typically consider both proprietary and open source alternatives.<sup>299</sup> However, the question can ultimately be left open, as even within a market for open source hypervisors, the Commission considers that the Transaction does not raise serious doubts as to its compatibility with the internal market (for the reasons stated below).
- (418) Second, as regards Red Hat's potential market power in server operating systems, as explained above, the Commission considers that Red Hat most likely does not have a sufficient degree of market power to leverage its position with RHEL to foreclose competitors in other markets.
- (419) Third, as regards IBM's alleged ability to use its position in IT services and/or in hardware markets as a lever to foreclose hypervisor competitors, the Commission considers it very unlikely. As such, even if (*quod non*) the current practice of Red Hat had an anti-competitive motive and an anti-competitive effect, this would not be merger specific. The reasons are twofolds.
- (420) In the first place, the Commission considers that IBM has no strong market position in any plausible IT services markets that it could leverage into another market, and this would not change post-merger, as Red Hat is not active in IT services.<sup>300</sup> Considering all segmentations of IT services markets considered by the Commission in the past (see section 4.5), there is no plausible IT services market where IBM's market share would equal or exceed 30%. Available data show that IBM's shares (both at EEA- and at worldwide level) remain below [5-10]% in the Gartner market for all "IT Services", as well as in IDC's "IT Services" and "Business Services" overall categories. Even on the basis of a narrow segmentation of the IT Services market, IBM's share does not exceed [20-30]% in any hypothetical market segmentations according to IDC and Gartner data.<sup>301</sup>
- (421) In the second place, as regards hardware, IBM's estimated market share of sales only exceeds 30% in two sub-segments of the server market (which may potentially constitute separate relevant markets although as explained in section 4.4 this can be left open), i.e. in mid-range (USD 100,000 – USD 999,999), and high-end server (USD 1 million and above). According to IDC, IBM's revenue share in the high-end segment is [70-80]% at the worldwide level and [50-60]% at the EEA level. It is [50-60]% and [60-70]% in the mid-range segment respectively at the worldwide level and at the EEA level. However, IBM's share in an overall market for servers is less than [0-5]% and is declining. As a result, the vast majority of hypervisors are not deployed on IBM servers, but in other

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<sup>298</sup> See replies to Questionnaire Q1 to competitors, question 54

<sup>299</sup> See replies to Questionnaire Q2 to customers, question 51

<sup>300</sup> See Form CO, paragraph 305.

<sup>301</sup> Section 5.3.6 below assesses more in details whether the merged entity would have the ability to leverage its position in IT services into neighbouring markets where Red Hat is active.

environments. Any leveraging of IBM's position in a plausible market for high-end and mid-range servers would not be capable of significantly affecting the overall demand for hypervisors, which is in its vast majority independent from IBM's servers.<sup>302</sup>

#### **5.3.4. Container Infrastructure Software - Leveraging the potentially strong position of Red Hat OpenShift into neighbouring markets where IBM is active**

##### **5.3.4.1. Potential concern**

(422) The second potential relevant market in which Red Hat has a market share in excess of 30% is the market for container infrastructure software (see section 5.2.8), in which Red Hat offers its OpenShift product. The Commission has assessed a potential competition concern whereby the merged entity would leverage Red Hat OpenShift's potentially strong position in a plausible market for container infrastructure software, into any other market(s) where IBM is active, by means of one of the practices described in section 5.3.2.

##### **5.3.4.2. Notifying Party's view**

(423) Red Hat's OpenShift, is probably the best example of a Red Hat product that is compatible with the products offered by IBM's competitors in different public clouds, private clouds and traditional enterprise stack environments, as OpenShift's objective is to facilitate the movement of workloads between these three environments.

(424) The Notifying Party submits that the merged entity will not have the ability and incentive to leverage OpenShift's potentially strong market position to boost IBM's sales and foreclose IBM's competitors in neighbouring markets, for the following reasons.

##### *As regards ability*

(425) The Notifying Party argues that the merged entity will not have the ability to foreclose rivals by leveraging Red Hat's position in container infrastructure software because Red Hat does not have sufficient market power in the market for container infrastructure software, for the following reasons.

(426) First, as explained in section 5.2.8, the Notifying Party submits that the possible market for container infrastructure software is fragmented and highly competitive. This potential market is nascent and developing rapidly, while Red Hat's market share is declining due to the significant competitive pressure from major public clouds' Kubernetes offerings (e.g., Amazon, Microsoft, and Google), other commercial platforms (e.g., Docker, Dell/EMC's Pivotal/VMware, Rancher, and Canonical), and DIY open source products. In 2018, Red Hat only had a market share of [30-40]%.

(427) Second, the Notifying Party claims that Red Hat's market power is further limited by the fact that OpenShift is open source and therefore can be forked, i.e., a

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<sup>302</sup> Section 5.3.5 below assesses more in details whether the merged entity would have the ability and incentive to leverage its potentially strong position in servers into neighbouring markets where Red Hat is active.

company may choose to take the open source code and develop it with community support under a different distribution.<sup>303</sup>

*As regards incentives*

- (428) According to the Notifying Party, the merged entity would also not have the incentive to degrade OpenShift's interoperability (whether by changing OpenShift's source code or by refusing to certify OpenShift) or to engage in an anticompetitive mixed bundling strategy involving OpenShift, because such strategies would not be profitable.
- (429) This is because there are many alternatives to OpenShift and customers are unlikely to switch to IBM platforms as a result of any strategy which would make the combination of OpenShift with third party platforms less competitive.

**5.3.4.3. Commission's assessment**

- (430) The Commission considers that the merged entity will not have the ability to foreclose rivals by leveraging Red Hat's position in container infrastructure software because Red Hat does not have sufficient market power in the market for container infrastructure software, in particular given its relatively low market share ([30-40]%) and the fact that Red Hat faces many strong competitors in that potential market.
- (431) Furthermore, as explained in section 5.2.8, and as acknowledged by the Parties' customers and competitors, the market for container infrastructure software is a nascent market with many new competing offerings. Over the period 2015-2017, Red Hat's market share declined from [60-70]% to [30-40]%, while a number of strong competitors entered the market (AWS, Google, VMware) or expanded (Docker).
- (432) The Commission also considers that the merged entity is unlikely to have the incentive to engage in any foreclosure strategy by leveraging its position with OpenShift. This is because OpenShift's business proposition in the nascent hybrid cloud environment is to use container technology precisely in order to allow applications to run anywhere, in any type of environment, including different public clouds, private clouds and traditional enterprise systems. Any attempt by the Parties to alter OpenShift's platform neutrality in favour of IBM's cloud products would move IBM into the same model as its cloud competitors, which are much larger and more successful than IBM itself. With this Transaction, IBM has the opportunity to offer a differentiated and attractive hybrid cloud proposition. This valuable opportunity would be sacrificed at a cost if IBM engaged in the types of foreclosure strategies discussed above.
- (433) The results of the market investigation confirm this view. The vast majority of customers consider that IBM will not have an incentive to alter OpenShift's platform neutrality.<sup>304</sup> They consider that Red Hat faces competition from strong alternatives, and that most customers would switch to these alternatives if

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<sup>303</sup> See Form CO, paragraph 847.

<sup>304</sup> See e.g. replies to Questionnaire Q2 to customers, question 48.

OpenShift's platform neutrality was altered.<sup>305</sup> To the question as to what their reaction would be if post-Transaction the merged entity were to no longer certify OpenShift in combination with third party products and only with products from the merged IBM/Red Hat entity, the majority of customers who are currently using OpenShift and who expressed an opinion on the question explained that they would switch to an alternative container infrastructure software.<sup>306</sup>

(434) Therefore, it is unnecessary to assess in more detail whether such foreclosure strategy would have a significant detrimental effect on competition.

### **5.3.5. Server markets - Leveraging the potentially strong position of IBM into neighbouring markets where Red Hat is active**

#### **5.3.5.1. Potential concern**

(435) A limited number of Red Hat competitors raised the concern that the merged entity may leverage IBM's market power in server markets, in particular with its IBM Power servers and its z System servers (also referred to as "Mainframe") to promote Red Hat products and in particular RHEL and foreclose competing products and in particular competing Linux distributions, through various practices which would effectively degrade the interoperability of these competing products with Mainframe and Power servers or through commercial practices equivalent to mix bundling that would advantage Red Hat products over competing products.

#### **5.3.5.2. Notifying Party's arguments**

(436) As explained in section 4.4 above, the Notifying Party views the relevant product market as comprising all servers. IBM's share in an overall market for servers is less than [0-5]% and is declining.<sup>307</sup>

(437) However, even if the Commission were to consider unduly narrow segments limited by price band (for mid-range and high-end servers), where IBM's estimated share of sales may exceed 30%, the Notifying Party submits that these estimated shares do not give rise to any credible non-horizontal concerns for the following reasons.

(438) First, the Notifying Party notes that IBM is already active in both servers and the neighboring market of operating systems, but continues to offer its servers independently and to ensure their compatibility with non-IBM operating systems.

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<sup>305</sup> For instance, a large customer explains: "[t]he success of Red Hat OpenShift is largely linked to the ecosystem Red Hat has struggled to build over these past few years, it is also what makes them successful. As there are other alternative solutions to their offer, they would kill their ecosystem by discriminating, reducing their reach and pushing customers and partners to other solutions". Another large customer further explains "The competition in this area is very aggressive. If the merged entity does not offer a wide compatibility, its products will be out of the market in some time". Another large customer also states: "[i]t is in the interest of OpenShift development to be as open as possible". See replies to Questionnaire Q2 to customers, question 48.

<sup>306</sup> See replies to Questionnaire Q2 to customers, question 49.

<sup>307</sup> See Form CO, paragraph 258.



- (439) Second, given the significantly higher value of IBM's servers relative to a RHEL subscription, it would not be profitable to pursue a strategy that would attempt to foreclose competing Linux distributions from IBM's servers, because the trade-off between lost sales of servers and gained sales of RHEL subscriptions would necessarily be negative. The Parties roughly estimate that the revenues derived by IBM from its server business associated with non-RHEL Linux distributions is multiple times more valuable than the revenues derived by the vendors of non-RHEL Linux distributions used on IBM servers. Therefore IBM would risk losing significant revenues by foreclosing rivals' Linux distributors – and in particular [...] – for a negligible potential gain.<sup>308</sup>
- (440) Third, the Notifying Party also submits that such strategy would not be profitable as customers are more likely to change platform than to change Linux distribution because it is easier to move workload running on a Linux distribution from IBM servers to other servers rather than to move the workload from one Linux distribution to another one.<sup>309</sup>
- (441) Fourth, the Notifying Party submits that any action to foreclose [...] on System z or POWER would cast doubts on IBM's commitment to open source, and could have an indirect negative effect on IBM's reputation in the open source community, threatening the achievement of the goals of the proposed Transaction.<sup>310</sup>
- (442) Finally, even if the merged entity had the ability or incentive to bundle its servers with RHEL or to degrade the interoperability of its servers with competing Linux distributions, the Notifying Party submits that this is unlikely to have any actual foreclosure effect on rival operating systems, given the small market opportunity represented by IBM servers. According to IDC, IBM's servers only represent [0-5]% and less than [0-5]% of all servers running Linux, by revenue and units, respectively. This also holds for other Red Hat products.<sup>311</sup>

### 5.3.5.3. Commission's assessment

- (443) The Commission considers that IBM could only potentially have market power and therefore the ability to leverage that market power into neighbouring markets, if the relevant product market is defined narrowly. On an overall market for servers, IBM has a market share below [10-20]% in terms of revenue and below [0-5]% in terms of units both at the EEA level and at the worldwide level according to Gartner and IDC.<sup>312</sup>
- (444) IBM's market share exceeds however 30% in both the high-end (USD 1 million and above) and mid-range (USD 100,000 – USD 999,999) server segments. As shown in Table below, in the potential market for high-end servers, IBM has a market share of [70-80]% in terms of revenue at a worldwide level in 2018,

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<sup>308</sup> SUSE claims to have a share of around [80-90]% of Linux deployments on IBM System z [...].

<sup>309</sup> See Notifying Party's response to the Commission's RFI 21.

<sup>310</sup> See Notifying Party's response to the Commission's RFI 21.

<sup>311</sup> See Form CO, paragraph 266.

<sup>312</sup> See Annex to Notifying Party's response to the Commission's RFI 9, question 4(iii)

according to IDC. At the EEA level, IBM has market share of [50-60]% in high-end servers.<sup>313</sup>

**Table 25: Market shares in high-end servers (worldwide 2015-2018)**

Company	2015		2016		2017		2018	
	Revenue (\$M)	Share(%)	Revenue (\$M)	Share(%)	Revenue (\$M)	Share(%)	Revenue (\$M)	Share(%)
IBM	[...]	[70-80]%	[...]	[60-70]%	[...]	[60-70]%	[...]	[70-80]%
Red Hat	-	-	-	-	-	-	-	-
<b>Combined</b>	[...]	[70-80]%	[...]	[60-70]	[...]	[60-70]%	[...]	[70-80]%
Fujitsu	[...]	[5-10]%	[...]	[5-10]%	[...]	[10-20]%	[...]	[10-20]%
HPE	[...]	[0-5]%	[...]	[5-10]%	[...]	[0-5]%	[...]	[5-10]%
Others	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: IDC

(445) As shown in Table 25, in the potential market for mid-range servers, IBM has a market share of [50-60]% in terms of revenue at a worldwide level in 2018, according to IDC. At the EEA level, IBM has market share of [60-70]% in mid-range servers.<sup>314</sup>

**Table 26: Market shares in mid-range servers (worldwide 2015-2018)**

Company	2015		2016		2017		2018	
	Revenue (\$M)	Share(%)	Revenue (\$M)	Share(%)	Revenue (\$M)	Share(%)	Revenue (\$M)	Share(%)
IBM	[...]	[50-60]%	[...]	[50-60]%	[...]	[60-70]%	[...]	[50-60]%
Red Hat	-	-	-	-	-	-	-	-
<b>Combined</b>	[...]	[50-60]%	[...]	[50-60]%	[...]	[60-70]%	[...]	[50-60]%
Oracle	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%	[...]	[10-20]%
HPE	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
<b>Others</b>	[...]	[5-10]%	[...]	[10-20]%	[...]	[5-10]%	[...]	[10-20]%

Source: IDC

(446) Despite IBM's high market shares in these two narrowly defined markets, the Commission considers that IBM would not have the ability and incentive to leverage its arguably strong market position in mid-range and high-end servers to favour Red Hat products in neighbouring markets (in particular RHEL) and in any event even if it had the ability and incentive to do so, this is unlikely to have any actual foreclosure effects on rival products in neighbouring markets and therefore any harm to consumers.

<sup>313</sup> According to Gartner, IBM has a market share of [90-100]% at the worldwide level and [90-100]% at the EEA level in the high-end segment.

<sup>314</sup> According to Gartner, IBM has a market share of [40-50]% at the worldwide level and [40-50]% at the EEA level in the mid-range segment.

*As regards ability*

- (447) The Commission considers that even if the merged entity had the incentive to leverage its position in servers to boost its sales of RHEL (and other Red Hat products) to the detriment of competing Linux distributions (and other competing products), it would anyway not have the ability to foreclose rival Linux distributions or other rival products of Red Hat, given the small market opportunity represented by IBM servers.
- (448) A large majority of the workloads of most companies do not run on IBM servers, but rather on competing x86 servers or in the cloud. As such most middleware or system infrastructure software of third parties that are competing with Red Hat do not run on IBM's servers. A large majority of the demand for these software would therefore be unaffected by any hypothetical exclusionary practice of the merged entity leveraging its position in servers.
- (449) As regards competing Linux distributions in particular, according to IDC, IBM's servers only represent [0-5]% and less than [0-5]% of all servers running Linux, by revenue and units, respectively. The Commission therefore considers that even if the merged entity had the incentive to foreclose competing Linux distributions from its server footprint, this would leave the vast majority of the demand for competing Linux distributions unaffected.
- (450) As for other infrastructure software and middleware competing with Red Hat, the Commission asked the Parties to estimate, for each Red Hat product, the proportion of customers that installed the Red Hat software/middleware on an IBM server, whether newly purchased or already installed.
- (451) The Parties estimated, for each Red Hat product, the overlap between Red Hat customers and IBM server customers in 2018 (purchases carried out in 2018). The Parties even estimated for each Red Hat product, the overlap between Red Hat customers in 2018 and the full installed base of IBM server customers (irrespective of when the server was purchased), by comparing the list of Red Hat customers in 2018 with the installed base of IBM server customers. These estimates shows that for most Red Hat products, there is minimal overlap between Red Hat's customers and IBM's server customer base. In fact, for most Red Hat products, this analysis shows that more than [90-100]% of Red Hat customers do not have an IBM server. There are only four products where the share of common customers exceeds [...]%: Red Hat Data Grid ([...]), Red Hat Ansible Network Automation ([...]), Red Hat Quay ([...]), and Red Hat Hyperconverged Infrastructure for Cloud ("RHHI for Cloud") ([...])<sup>315</sup>. However, the Notifying Party confirmed that although there is a significant overlap in the customer base for these products, these Red Hat products are not typically used for the same use cases as IBM servers, or in other words even in cases where there is customer overlap, IBM servers and these Red Hat products are used for different purposes (i.e. the Red Hat product will most of the time be installed on competing servers rather than on the IBM servers).<sup>316</sup>

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<sup>315</sup> [...].

<sup>316</sup> See Parties' response to Commission's RFIs 16 and 18, including Annex RFI 18 Q.2(a).

*As regards incentives*

- (452) The Commission has doubts whether the merged entity would have the incentive to anticompetitively bundle its servers only with RHEL or to degrade interoperability of its servers with third party Linux distributions, for the following reasons.
- (453) First, the Commission notes that IBM competes against other server platforms (including x86), public cloud, and SaaS, all of which offer multi-vendor Linux support. This is true although some of them have their own Linux distribution (e.g AWS, Microsoft Azure, Google Cloud Platform). This suggests that customers expect to be able to run their workload on their favourite Linux distribution irrespective of the platform chosen.
- (454) Second, the Commission notes that doing so would likely be seen as a hostile move by IBM going against its general commitment to open source, and could have an indirect negative effect on IBM's reputation in the open source community.
- (455) Third, the Commission takes note that the potential gains from any such foreclosure strategy would be rather limited as opposed to the potential risk, given the relative value of IBM servers compared to RHEL. However, the Commission has not been able to confirm the Notifying Party's view according to which it is easier for a client to move workloads on a Linux distribution from an IBM server to another server than to move workloads from one Linux distribution to another. If the merged entity were to cut SUSE off from its IBM servers, it is therefore unclear to the Commission how customers would react, i.e. whether they would move their SUSE workloads to other environments running SUSE or instead whether they would move their workloads to RHEL to keep them on IBM servers. On balance, therefore, the Commission cannot take a position on whether engaging in such foreclosure strategy would be immediately profitable or not (ignoring the indirect negative effect on the merged entity's reputation).
- (456) Fourth, irrespective of whether this would be profitable or not, the Commission has not found [...] that IBM is counting on any synergy from the Transaction that would involve leveraging IBM's position in hardware to sell more RHEL or any other Red Hat products.
- (457) In any event, the Commission notes that IBM and SUSE [...].<sup>317</sup> The Commission also notes that in an email to all addressees of the June edition of the "*Partner for Growth with IBM Server Solutions*" newsletter distributed by IBM's Systems Middle East and Africa team, IBM makes clear that "*today IBM supports multiple variants of Linux – including Canonical (Ubuntu), SUSE, and Red Hat – on IBM servers, and that will not change upon the expected closing of IBM's acquisition of Red Hat. IBM will not have a default or preferred variant of the Linux operating system for IBM servers. IBM will continue to work with different Linux distributors in an effort to provide clients with the flexibility and choice they expect from IBM*".<sup>318</sup>

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<sup>317</sup> See [...].

<sup>318</sup> See the Notifying Party's response to a Commission's request for information of 21 June 2019.

(458) As regards Canonical which also has a partnership agreement with IBM, to have its Linux distribution “Ubuntu” supported on IBM Power and z servers, the Commission assumes that the merged entity would have the same incentive to continue its partnership agreement. In any event, [...].<sup>319</sup> As such, even if the merged entity were to take Ubuntu off from its servers, this would have no significant impact on Ubuntu’s ability to continue competing with RHEL in other environments. Moreover, it would also have a negligible impact on customers’ choice and competition in the IBM servers footprint, as SUSE and RHEL together account for close to 100% of all Linux deployments on IBM servers.

*As regards effects*

(459) Finally, even if IBM had the ability or incentive to bundle its servers with RHEL or other Red Hat products or to degrade the interoperability of its servers with rival operating systems or other rival products, the Commission considers that this is unlikely to have any actual foreclosure effect on rival operating systems or other rival products and therefore any harm to consumers, given the small market opportunity represented by IBM servers (see paragraphs 449-451 above)

**5.3.6. *IT services markets – Leveraging the potentially strong position of IBM into neighbouring markets where Red Hat is active***

**5.3.6.1. Potential concern**

(460) A small number of market participants expressed concerns that through its role as alleged global leader in IT services and IT consultancy, IBM would be able to substantially influence end customers’ purchasing decisions for software products in favour of Red Hat products and to the detriment of competing vendors’ products post-transaction, thereby potentially foreclosing competitors.

**5.3.6.2. Notifying Party’s view**

*As regards ability*

(461) The Notifying Party submits that IBM does not currently have, and will not gain as a result of the Transaction, the ability to influence customers’ purchasing decisions in favour of Red Hat products and to the detriment of competing vendors’ products, for the following reasons.

(462) First, IBM, through its IT Services business (Global Business Services (“GBS”) and Global Technology Services (“GTS”)),<sup>320</sup> does not have market power under any plausible market segmentation. IBM’s shares (both at EEA- and at worldwide level) remain below [5-10]% in the Gartner market for all “IT Services”, as well as in IDC’s “IT Services” and “Business Services” overall categories. Even on the basis of a narrow segmentation of the IT Services market, IBM’s share does not exceed [20-30]% in any hypothetical market segmentations according to IDC and

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<sup>319</sup> See Notifying Party’s response to Commission’s RFI 21

<sup>320</sup> IBM markets IT Services to enterprises under the IBM Services brand. IBM Services includes two operationally distinct businesses, Global Business Services (“GBS”) and Global Technology Services (“GTS”), each with a different focus: GBS mainly provides strategy and architecture consulting services, while GTS generally provides outsourcing services.

Gartner data. IBM also faces strong rivals in IT Services, including Accenture, McKinsey, Deloitte, E&Y, PWC, Oracle, SAP, and others, who enjoy market positions equivalent to IBM's.

- (463) Second, IBM's GTS<sup>321</sup> has to deal with customers' existing IT architecture constraints and would not in any event be able to impose its own products on the customer.
- (464) Third, both GBS<sup>322</sup> and GTS' customers are usually large and sophisticated customers with their own IT departments who often have precise ideas about what solutions they need before they even involve IBM as an advisor. Therefore, IBM's role essentially involves implementing the clients' choices rather than influencing these choices.

*As regards incentives*

- (465) The Notifying Party also submits that IBM will not have the incentive to foreclose competitors' solutions by leveraging IBM Services in order to push Red Hat software to the detriment of competing vendors' products that are more suitable to meet the customers' needs.
- (466) According to the Notifying Party, doing so (i) would damage its credibility as a neutral advisor and result in diverting sales to the many other vendors that provide the same services as GBS and GTS, (ii) be at odds with IBM's past practices in IT services, and (iii) not result in any significant increase of Red Hat products' sales

### **5.3.6.3. Commission's assessment**

- (467) The Commission considers that the merged entity will not have the ability to significantly influence customers' purchasing decisions in favour of Red Hat products and to the detriment of competing vendors' products, let alone significantly foreclose access to a sufficient customer base to Red Hat's competitors, for the reasons set out below. Therefore, it is unnecessary to assess in more detail whether the merged entity would have an incentive to engage in such practice and whether such foreclosure strategy would have a significant detrimental effect on competition.

*As regards ability*

- (468) First, the Commission considers that IBM has no strong market position in any plausible IT services markets that it could leverage into another market, and this would not change post-merger, as Red Hat is not active in IT services.<sup>323</sup> As submitted by the Notifying Party, and considering all segmentations of IT services markets considered by the Commission in past decisions (see section 4.5), there is no plausible IT services market where IBM's market share would

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<sup>321</sup> The focus of GTS is to provide implementation, outsourcing and support (maintenance) for enterprise IT infrastructure environments comprised of hardware, middleware software, networking, mobile devices, etc.

<sup>322</sup> GBS provides three broad categories of services: (i) IT Consulting, (ii) Application Management, and (iii) Cognitive Process services.

<sup>323</sup> See Form CO, paragraph 305.

equal or exceed 30%, with the exception of two narrowly defined product markets only when looking at data on a narrow country-level<sup>324</sup> – i.e. the potential markets for Managed Services and Cloud Infrastructure Services in the wholesale trade sector, in Austria ([30-40]%) and Denmark ([30-40]%).<sup>325</sup> In addition, IBM faces strong global rivals in all potential markets for IT services, including Accenture, Amazon, Atos, Capgemini (which recently announced that it will acquire Altran), Cisco, Cognizant, Dell-EMC, Deloitte, DXC, EY, Fujitsu, HPE, Infosys, Microsoft, NTT Data, Oracle, PwC, SAP, Tata, and many others. This is also true for the potential markets for Managed Services and Cloud Infrastructure Services in the wholesale trade sector in Austria and Denmark, where Capgemini, Accenture, DXC, Cisco and Ricoh are particularly active.<sup>326</sup>

- (469) Second, customers responding to our market investigation indicated in their vast majority that IBM’s influence on their company’s purchasing decisions for hardware or software is either “limited” or “very limited”.<sup>327</sup>
- (470) Third, even assuming that demand for IBM IT services is not contestable, and therefore that IBM could steer customers’ choice towards Red Hat products to the detriment of equally or more suitable competing third party products without risking to lose their client, the Commission considers that the merged entity would not have the ability to foreclose access to a sufficient customer base. The market investigation has shown that IBM’s GBS and GTS business units (all IT services included) do not constitute a sufficiently important ‘route to market’ to

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<sup>324</sup> Based on IDC data, IBM’s share is consistently below 30% in all segments, even at the national level. Based on Gartner data, IBM’s share is consistently below 30% both when segmenting by functionality and when segmenting by industry, even at the national level. Only when combining Gartner’s functionality and industry segments, AND looking at data on a narrow country-level, IBM’s share exceptionally exceeds 30% in a mere two combinations of (i) “Service 2” level functionality segments and (ii) industry sectors, out of 880 possible combinations in total (*i.e.*, less than 0.3%), which both concern Managed Services and Cloud Infrastructure Services in the wholesale trade sector, in Austria ([30-40]%) and Denmark ([30-40]%). See the Notifying Party’s response to the Commission’s RFI 23.

<sup>325</sup> Even assuming that IBM could leverage its position in these two narrowly defined markets to push for the adoption of Red Hat products instead of equally or more suitable competing third party products without the risk of losing IT services customers to competitors (*quod non*), the Commission considers that the merged entity will not have the ability to significantly foreclose access to a sufficient customer base to Red Hat’s competitors. This is because the middleware and system infrastructure software markets in which Red Hat is active are either EEA-wide or worldwide. As a result, as confirmed by the Notifying Party, the customers of IBM’s GBS and GTS in the potential markets for Managed Services and Cloud Infrastructure Services in the wholesale trade sector in Austria and Denmark only represent, at most, a very small proportion of Red Hat’s customer base for any of its products at the EEA and worldwide level.

<sup>326</sup> In this respect, the Commission notes that recently, IBM decided to withdraw its notification in Case B7-50/19 – IBM/T-Systems, notified to the German Federal Cartel Office (“FCO”), following the opening of an in-depth investigation by the FCO. In a press release, the FCO set out its provisional view that mainframe services (i.e. IT outsourcing of aftermarket services for mainframe systems) could constitute a distinct product market and that IBM might hold a dominant position in the EEA. The Notifying Party strongly disagrees with this provisional view of the FCO. In particular, even if such market existed, the Notifying Party argues that its market share on such market would only be [20-30]%, taking into account both internally supplied services as well as outsourced services. However, even if there was a relevant market for mainframe services in the EEA and even if IBM were to be considered dominant on such market, the Commission considers that the merged entity would have no ability to use its position in mainframe services to exclude competitors of Red Hat’s products. This is because mainframe servers (to which mainframe services relate) represent only a tiny fraction of overall deployments for the software categories where Red Hat is active (see section 5.3.5).

<sup>327</sup> See replies to Questionnaire Q2 to customers, question 56.

significantly limit access of Red Hat rivals to customers. Indeed, the vast majority of Red Hat's competitors have indicated that they have less than 10% of their software sales for which IBM is involved as an intermediary (e.g. system integrator), as an IT consultant or as an other type of IT service provider.<sup>328</sup> Even if for these sales they were entirely dependent on IBM (*quod non*), this would not be sufficient to foreclose access of Red Hat's rivals to a sufficient customer base.

### 5.3.7. *Other non-horizontally affected markets – Leveraging the potentially strong position of IBM into neighbouring markets where Red Hat is active*

#### 5.3.7.1. *Potential concern*

(471) Sections 5.3.3 and 5.3.4 assessed whether the merged entity would have the ability and incentive to leverage Red Hat's position in the two markets where Red Hat has an individual market share in excess of 30% at the worldwide and EEA level – i.e. paid operating systems (and paid Linux operating systems in particular) and container infrastructure software – into neighbouring markets where IBM is active. Section 5.3.5 assessed whether the merged entity would have the ability and incentive to leverage IBM's market position in the potential markets for high-end and mid-range servers in which IBM has a market share in excess of 30% into neighbouring markets where Red Hat is active.

(472) As shown in section 5.3.1, there are 13 additional IDC and/or Gartner market segments where IBM has an individual market share in excess of 30% at the worldwide and/or EEA level. Although, no market participant raised conglomerate or non-horizontal concern with respect to those markets, the Commission assesses in this section whether the merged entity would have the ability and incentive to leverage IBM's position in those potential markets to boost Red Hat's sales in neighbouring markets and foreclose Red Hat's competitors.

#### 5.3.7.2. *Notifying Party's view*

(473) The Notifying Party submits that the Transaction will not enable IBM to leverage any of its potentially strong market positions in any of the market segments where it has more than 30% market into any of the segments where Red Hat is active. The reasons are the following.<sup>329</sup>

(474) First, IBM's worldwide or EEA-wide share exceeds 40% only in the following segments: Transaction Processing Monitors (IDC and Gartner), Paid Unix and Other OS (Gartner), Message-Oriented Middleware (Gartner), Storage Management Mainframe Software (Gartner), and WEB Access Management (Gartner).<sup>330</sup> The Notifying Party therefore considers that only in relation to these segments, could IBM potentially have sufficient market power.

(475) Second, there are no major Red Hat products that are interoperable with IBM's Storage Management Mainframe Software products. This is sufficient to discard

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<sup>328</sup> See replies to Questionnaire Q1 to competitors, question 58.

<sup>329</sup> See the Notifying Party's response to the Commission's RFI 16.

<sup>330</sup> See section 5.3.7.3 below.



any risk that IBM would leverage its position on Storage Management Mainframe Software to push Red Hat's products.

- (476) With respect to the other four segments, the Notifying Party submits that Red Hat has few main products that are supported and interoperable with IBM's offerings. With respect to all four of these segments, the Notifying Party submits that the merged entity will however not have the ability to engage in anticompetitive bundling or tying, or in interoperability degradation, post-Transaction for the following reasons.
- (477) In the first place, there are many rivals with similar offerings and there is no bundle of functionalities that IBM/Red Hat's products could offer in combination that is not already offered or could not be offered by one or more of the major rivals.
- (478) In the second place, in the software markets where Red Hat is active, these IBM offerings are not critical complementary products without which competing software vendors could not develop or effectively sell their software on the market.
- (479) In the third place, the Notifying Party submits that there is no large common pool of customers for Red Hat's software products and IBM's offerings in the above-listed segments.
- (480) The Notifying Party also submits that the merged entity will not have the incentive to engage in anticompetitive leveraging post-Transaction. Such a strategy would not be profitable because customers would rather move away from IBM's proprietary software than adopt Red Hat's software offering if it is not its preferred solution, for at least the following reasons.
- (481) In the first place, customers' preferences across combinations of IT products are heterogeneous.
- (482) In the second place, customers' preferences across IT products change over time and technology continuously evolves, many customers prefer to mix and match complementary software and service offerings from different vendors and avoid being locked into a particular vendor.
- (483) In the third place, system integrators and resellers offer customers mix-and-match solutions integrating products and functionality from different vendors.

### **5.3.7.3. *Market shares***

#### **Deployment-Centric Application Platform**

- (484) The Parties activities overlap in this IDC segment and their combined market share exceeds 20%. The market shares are therefore presented under section 5.2.2 above.

#### **Business Process Management Suites**

- (485) The Parties activities overlap in this Gartner segment and their combined market share exceeds 20%. The market shares are therefore presented under section 5.2.3 above.

### Transaction Processing Monitors

(486) The market shares of the Parties and their competitors in the IDC segment for Transaction Processing Monitors both at the worldwide and the EEA level are presented in Tables 27-28 below.

**Table 27: Market shares in Transaction Processing Monitors (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[70-80]%	[...]	[70-80]%	[...]	[70-80]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[70-80]%</b>	[...]	<b>[70-80]%</b>	[...]	<b>[70-80]%</b>
Oracle	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Hewlett Packard Enterprise	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Hitachi	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Fujitsu	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Unicom Systems	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: IDC

**Table 28: Market shares in Transaction Processing Monitors (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[70-80]%	[...]	[70-80]%	[...]	[70-80]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[70-80]%</b>	[...]	<b>[70-80]%</b>	[...]	<b>[70-80]%</b>
Oracle	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Hewlett Packard Enterprise	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Fujitsu	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: IDC

### Event-Driven Middleware

(487) The Parties activities overlap in this IDC segment and their combined market share exceeds 20%. The market shares are therefore presented under section 5.2.5 above.

### Managed File Transfer Software

(488) The market shares of the Parties and their competitors in the IDC segment for Managed File Transfer Software both at the worldwide and the EEA level are presented in Tables 29-30 below.

**Table 29: Market shares in Managed File Transfer Software (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[30-40]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
Axway	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
SWIFT	[...]	[5-10]%	[...]	[10-20]%	[...]	[10-20]%
Saison	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Ipswitch	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
GlobalSCAPE	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: IDC

**Table 30: Market shares in Managed File Transfer Software (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>
SWIFT	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Axway	[...]	[20-30]%	[...]	[20-30]%	[...]	[10-20]%
Primeur	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Ipswitch	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Attunity	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: IDC

### Non-Relational Database Management

(489) The market shares of the Parties and their competitors in the IDC segment for Non-Relational Database Management both at the worldwide and the EEA level are presented in Tables 31-32 below.<sup>331</sup>

<sup>331</sup> Under Gartner's segment for Prerelational-era DBMS, IBM's market at the EEA level for 2018 is [30-40]%.

**Table 31: Market shares in Non-Relational Database Management (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[20-30]%	[...]	[10-20]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>	[...]	<b>[10-20]%</b>
Microsoft	[...]	[40-50]%	[...]	[40-50]%	[...]	[40-50]%
InterSystems	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Apple	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
CA Technologies	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Software AG	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: IDC

**Table 32: Market shares in Non-Relational Database Management (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[30-40]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
Microsoft	[...]	[30-40]%	[...]	[30-40]%	[...]	[30-40]%
InterSystems	[...]	[5-10]%	[...]	[10-20]%	[...]	[10-20]%
CA Technologies	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Apple	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
Software AG	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: IDC

### AD Mainframe Tools

(490) The market shares of the Parties and their competitors in the Gartner segment for AD Mainframe Tools both at the worldwide and the EEA level are presented in Tables 33-34 below.

**Table 33: Market shares in AD Mainframe Tools (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[30-40]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
CA Technologies	[...]	[30-40]%	[...]	[40-50]%	[...]	[30-40]%
Compuware	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Broadcom Ltd	-	-	-	-	[...]	[10-20]%
Software AG	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Micro Focus International	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

**Table 34: Market shares in AD Mainframe Tools (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[30-40]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
CA Technologies	[...]	[30-40]%	[...]	[30-40]%	[...]	[20-30]%
Compuware	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Software AG	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Broadcom	[...]	[0-5]%	[...]	[0-5]%	[...]	[5-10]%
Micro Focus	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

### Storage Management Mainframe Software

(491) The market shares of the Parties and their competitors in the Gartner segment for Storage Management Mainframe Software both at the worldwide and the EEA level are presented in Tables 35-36 below.

**Table 35: Market shares in Storage Management Mainframe Software (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[40-50]%	[...]	[50-60]%	[...]	[50-60]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[40-50]%</b>	[...]	<b>[50-60]%</b>	[...]	<b>[50-60]%</b>
CA Technologies	[...]	[20-30]%	[...]	[20-30]%	[...]	[10-20]%
Dell	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
Broadcom Ltd	-	-	-	-	[...]	[5-10]%
Hitachi	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
BMC Software	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[20-30]%	[...]	[5-10]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

**Table 36: Market shares in Storage Management Mainframe Software (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[50-60]%	[...]	[50-60]%	[...]	[50-60]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[50-60]%</b>	[...]	<b>[50-60]%</b>	[...]	<b>[50-60]%</b>
CA Technologies	[...]	[20-30]%	[...]	[20-30]%	[...]	[10-20]%
Dell	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
Broadcom Ltd	-	-	-	-	[...]	[5-10]%
BMC	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Hitachi	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[10-20]%	[...]	[5-10]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

### Web Access Management Software

(492) The market shares of the Parties and their competitors in the Gartner segment for Web Access Management Software both at the worldwide and the EEA level are presented in Tables 37-38 below.

**Table 37: Market shares in Web Access Management Software (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[30-40]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
Oracle	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
CA Technologies	[...]	[10-20]%	[...]	[10-20]%	[...]	[5-10]%
Forgerock	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Ping Identity	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
RSA	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

**Table 38: Market shares in Web Access Management Software (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[40-50]%	[...]	[40-50]%	[...]	[40-50]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[40-50]%</b>	[...]	<b>[40-50]%</b>	[...]	<b>[40-50]%</b>
Oracle	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
CA Technologies	[...]	[10-20]%	[...]	[10-20]%	[...]	[5-10]%
Forgerock	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Broadcom Ltd	-	-	-	-	[...]	[0-5]%
RSA	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

### Security Information and Event Management

(493) The market shares of the Parties and their competitors in the Gartner segment for Security Information and Event Management both at the worldwide and the EEA level are presented in Tables 39-40 below.

**Table 39: Market shares in Security Information and Event Management (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[30-40]%	[...]	[20-30]%	[...]	[20-30]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[30-40]%</b>	[...]	<b>[20-30]%</b>	[...]	<b>[20-30]%</b>
Splunk	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Micro Focus International	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
LogRhythm	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
RSA	-	-	[...]	[5-10]%	[...]	[0-5]%
McAfee	-	-	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[30-40]%	[...]	[30-40]%	[...]	[20-30]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

**Table 40: Market shares in Security Information and Event Management (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[40-50]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[40-50]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
Splunk	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Micro Focus International	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
LogRhythm	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
McAfee	-	-	[...]	[0-5]%	[...]	[0-5]%
RSA	-	-	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[30-40]%	[...]	[30-40]%	[...]	[20-30]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

### Security Testing

(494) The market shares of the Parties and their competitors in the Gartner segment for Security Testing both at the worldwide and the EEA level are presented in Tables 41-42 below.



**Table 41: Market shares in Security Testing (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	[20-30]%	[...]	[20-30]%	[...]	[20-30]%
Micro Focus	-	-	[...]	[5-10]%	[...]	[10-20]%
CA Technologies	-	-	[...]	[10-20]%	[...]	[10-20]%
Synopsys	-	-	[...]	[10-20]%	[...]	[10-20]%
WhiteHat	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Paragrapsoft	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Others	[...]	[50-60]%	[...]	[30-40]%	[...]	[20-30]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

**Table 42: Market shares in Security Testing (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[30-40]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	[30-40]%	[...]	[30-40]%	[...]	[30-40]%
Synopsys	-	-	[...]	[10-20]%	[...]	[10-20]%
Micro Focus International	-	-	[...]	[5-10]%	[...]	[10-20]%
CA Technologies	-	-	[...]	[10-20]%	[...]	[10-20]%
WhiteHat	[...]	[5-10]%	[...]	[0-5]%	[...]	[0-5]%
Broadcom Ltd	-	-	-	-	[...]	[0-5]%
Others	[...]	[50-60]%	[...]	[30-40]%	[...]	[20-30]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

Other ITOM (i.e. IT operations management software other than ITOM Mainframe tools)

(495) The market shares of the Parties and their competitors in the Gartner segment for Other ITOM both at the worldwide and the EEA level are presented in Tables 43-44 below.

**Table 43: Market shares in Other ITOM (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[20-30]%	[...]	[10-20]%	[...]	[10-20]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[20-30]%</b>	[...]	<b>[10-20]%</b>	[...]	<b>[10-20]%</b>
Oracle	[...]	[50-60]%	[...]	[40-50]%	[...]	[40-50]%
Microsoft	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
Quest Software	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
Dell	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
SolarWinds	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

**Table 44: Market shares in Other ITOM (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[40-50]%	[...]	[30-40]%	[...]	[30-40]%
Red Hat	-	-	-	-	-	-
<b>Combined</b>	[...]	<b>[40-50]%</b>	[...]	<b>[30-40]%</b>	[...]	<b>[30-40]%</b>
Oracle	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Microsoft	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
SAP	[...]	[0-5]%	[...]	[10-20]%	[...]	[10-20]%
Google	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
Micro Focus	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

### Paid Unix and Other OS

(496) The market shares of the Parties and their competitors in the Gartner segment for Paid Unix and Other OS both at the worldwide and the EEA level are presented in Tables 45-46 below.

**Table 45: Market shares in Paid Unix and Other OS (Worldwide, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[40-50]%	[...]	[50-60]%	[...]	[50-60]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[40-50]%</b>	[...]	<b>[50-60]%</b>	[...]	<b>[50-60]%</b>
HPE	[...]	[10-20]%	[...]	[10-20]%	[...]	[10-20]%
Oracle	[...]	[10-20]%	[...]	[5-10]%	[...]	[5-10]%
Fujitsu	[...]	[0-5]%	[...]	[5-10]%	[...]	[5-10]%
Hitachi	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
NEC	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

**Table 46: Market shares in Paid Unix and Other OS (EEA, 2016-2018)**

Company	2016		2017		2018	
	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)	Revenue (\$M)	Share (%)
IBM	[...]	[50-60]%	[...]	[50-60]%	[...]	[50-60]%
Red Hat	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
<b>Combined</b>	[...]	<b>[50-60]%</b>	[...]	<b>[50-60]%</b>	[...]	<b>[50-60]%</b>
HPE	[...]	[20-30]%	[...]	[10-20]%	[...]	[10-20]%
Oracle	[...]	[10-20]%	[...]	[5-10]%	[...]	[5-10]%
Micro Focus International	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Hitachi	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Fujitsu	[...]	[0-5]%	[...]	[0-5]%	[...]	[0-5]%
Others	[...]	[5-10]%	[...]	[5-10]%	[...]	[5-10]%
<b>Total</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>	[...]	<b>100.0%</b>

Source: Gartner

#### 5.3.7.4. Commission's assessment

- (497) The Commission considers that the merged entity will not have the ability to leverage IBM's position in any of the market segments mentioned in section 5.3.7.3 above to boost Red Hat sales in neighbouring software markets and foreclose competitors, for the reasons set out below. Therefore, it is unnecessary to assess in more detail whether such foreclosure strategy would have a significant detrimental effect on competition.
- (498) First, as presented in section 5.3.7.3, the Commission notes that IBM's worldwide or EEA-wide share exceeds 40% only in the following segments: Transaction Processing Monitors (IDC and Gartner), Paid Unix and Other OS (Gartner), Message-Oriented Middleware (Gartner), Storage Management Mainframe Software (Gartner), and WEB Access Management (Gartner). Moreover, whether in these market segments or in the other ones where IBM's market share is

between 30% and 40%, the Commission considers that there are a number of credible alternatives available, as there are at least three significant competitors in each of those market segments. This is confirmed by the results of the market investigation for all but one market segment, as, with the exception of the segment for Transaction Processing Monitors, the vast majority of customers consider that in each segment listed in section 5.3.7.3, there are sufficient credible alternatives to IBM's products.<sup>332</sup>

- (499) Second, there is only a limited overlap between Red Hat's and IBM's customer bases. The Commission asked the Parties to estimate, for each Red Hat product, the proportion of Red Hat customers that are also customers of one of the IBM products in any of the market segments in which IBM has an individual market share above 40% at the worldwide or EEA level in 2018 (Transaction Processing Monitors (IDC and Gartner), Paid Unix and Other OS (Gartner), Message-Oriented Middleware (Gartner), Storage Management Mainframe Software (Gartner), and WEB Access Management (Gartner)).<sup>333</sup>
- (500) The analysis of the Parties covered IBM customers with revenues for the relevant software segments in 2018, and this included revenues from the purchase of new (perpetual or fixed term) licenses as well as annual subscription and support ("S&S") revenue.<sup>334</sup> Taken together, these customers materially cover the entire installed base for the relevant IBM software products.<sup>335</sup>
- (501) The analysis of the Parties shows that there is a limited overlap between Red Hat's customers and IBM's customer base of IBM products that belong to any of the market segments in which IBM has an individual market share above 40% at the worldwide or EEA level in 2018. It shows that the vast majority of Red Hat's customers overall (more than [...]%) was not also a customer of IBM products in any one of the relevant segments. Actually, there is not a single Red Hat product for which more than [...]% of the customers are also customers of any of the IBM products in any of the above-mentioned segments. As regards in particular the segment for Transaction Processing Monitors for which just more than half of the customers considered that there were not sufficient credible alternatives to IBM's products, there is not a single Red Hat product for which more than [...]% of the customers are also customers of IBM's products belonging to the segment Transaction Processing Monitors.<sup>336</sup>
- (502) Moreover, even where a customer overlaps between a Red Hat product and an IBM product, these products are often not used together for the same use cases, and therefore a degradation of interoperability would have at most an insignificant effect on demand for competing products of Red Hat. The Commission therefore considers that IBM will have limited ability to affect the demand for Red Hat's and its competitors' offerings through bundling/tying or relative degradation of interoperability.

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<sup>332</sup> See replies to Questionnaire Q2 to customers, question 53.

<sup>333</sup> See Notifying Party's response to Commission's RFI 16 and RFI 18.

<sup>334</sup> IBM Software Subscription and Support ("S&S") entitles customers to product updates, bug fixes and technical support for their software. For more information, please see [https://www.ibm.com/software/passportadvantage/software\\_subscription\\_support\\_ov.html](https://www.ibm.com/software/passportadvantage/software_subscription_support_ov.html).

<sup>335</sup> [...].

<sup>336</sup> See Notifying Party's response to question 3.b of RFI 16 and to question 2.b of RFI 18.

(503) As regards the merged entity's potential **incentive** to leverage strong IBM market positions into Red Hat positions, the Commission notes that it has not found a single internal document indicating that this was one of the synergies considered by the Notifying Party. Moreover, not a single competitor of Red Hat expressed any such concern.

### 5.3.8. *Potential input foreclosure of RHEL competitors by withholding access to RHEL's source code*

#### 5.3.8.1. Potential concern

(504) Red Hat's business is based on open source technologies and, as a matter of principle, the source code of all of the software that Red Hat develops is licensed under terms that permit any recipient to access, use, change or share this source code.<sup>337</sup> With respect specifically to RHEL's source code, Red Hat's practice has so far enabled competitors (including Oracle<sup>338</sup>) to access and use this source code in order to offer clones of RHEL ("RHEL clones" or replicates of RHEL). The main RHEL clone is Oracle Linux which was launched in 2006.<sup>339</sup>

(505) Based on feedback from the market investigation and in particular on a concern raised by Oracle, the Commission has assessed a potential competitive concern, whereby the Merged Entity would have the ability and the incentive to foreclose access to RHEL's source code which is a key input in order to enable competitors to offer replicates of RHEL.

(506) According in particular to Oracle, such a foreclosure strategy would prevent RHEL's competitors from continuing to offer alternative Linux distribution which are fully compatible with RHEL.<sup>340</sup> Oracle claims that this would in turn result in a significant increase of the costs and efforts that customers have to incur in order to switch away from RHEL. In particular, Oracle explains that, while switching from RHEL to a RHEL clone would be "*seamless*", switching from RHEL to any other Linux distribution would require customers to recertify, retest and reinstall applications in full in a process, which would also require potential application modifications.<sup>341</sup> Oracle therefore claims that the competitive pressure currently exercised by RHEL clones and in particular by Oracle Linux would be undermined.<sup>342</sup>

(507) Based on the above, such a strategy aimed at foreclosing RHEL clones by preventing access to RHEL's source code could potentially result in an increase of Red Hat's market power on a market for paid Linux-based server operating systems where, as explained in more details at the above paragraph (392), Red Hat's current market share exceeds 70%. Such an increased market power could in turn potentially result in a higher priced RHEL or in a decrease in the quality of

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<sup>337</sup> See Form CO, paragraphs 19 and 227. For example at paragraph 227, the Notifying Party states: "*In addition, Red Hat makes the source code for its products available for download under open source licenses*".

<sup>338</sup> On Oracle's current access to RHEL's source code see paragraph (522) below.

<sup>339</sup> The Notifying Party also mentions the following RHEL clones: Scientific Linux, Red Hat sponsored CentOS project and Amazon Linux 2. See Form CO, paragraph 227.

<sup>340</sup> See Oracle's reply to Questionnaire Q1 to competitors, question 41.

<sup>341</sup> See Oracle's reply to Questionnaire Q1 to competitors, question 41.

<sup>342</sup> See Oracle's reply to Questionnaire Q1 to competitors, question 41.

this product. It could also potentially be leveraged in a wide range of hardware and software markets which interact with RHEL.

#### 5.3.8.2. Notifying Party's view

- (508) The Notifying Party submits that, after the Transaction, the Merged Entity will have the same constraints on its ability to interfere with Oracle or any other competitors' access to RHEL source code, and if anything less incentive than Red Hat may have to do so.<sup>343</sup> The Notifying Party's view is based *inter alia* on the following arguments:<sup>344 345</sup>
- (509) First, under the General Public Licence ("GPL"), Red Hat's distributees, including its customers and developers, are free to distribute RHEL open source code under the GPL and could do so easily and promptly in response to any foreclosure attempt.
- (510) Second, even if Red Hat could interfere with Oracle's access to RHEL source code under the GPL, it has not done so pre-merger because of its dependency on the community of open source developers, which will continue post-merger.
- (511) Third, the Notifying Party disagrees with Oracle's claim that Oracle Linux is an exact substitute for RHEL and that switching between RHEL and Oracle Linux is seamless. Indeed, the Notifying Party claims that, as for any change of server operating systems, a switch from RHEL to Oracle Linux would require to retest applications in full and may require the reinstallation of applications, including potential modifications, as well as potential recertification.
- (512) Fourth, the Notifying Party argues that migrating workloads between RHEL and other Linux distributions, including SUSE and Ubuntu, does not present significant barriers and regularly occurs in practice.
- (513) Fifth, the Notifying Party argues that the Merged Entity would have little to gain in additional RHEL revenues from trying to divert RHEL clones' customers to RHEL given that RHEL clones' sales are extremely small.
- (514) Sixth, the Notifying Party argues that IBM will not be incentivized, post-Transaction, to divert sales from Oracle Linux to increase IBM's sales in other product areas where IBM competes with Oracle because, in particular, given Oracle Linux's negligible market share, the amount of Oracle products that might compete with IBM offerings sold together with Oracle Linux is limited. Therefore, IBM would not make any material gain from trying to divert customers from Oracle to win customers on other types of software for which it competes with Oracle, such as databases and application servers.
- (515) Seventh, the Notifying Party argues that RHEL clones represent only a very small share of server operating systems (and even of Linux server operating systems).

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<sup>343</sup> See the Notifying Party's response to the Commission's RFI 19.

<sup>344</sup> A number of other arguments put forward by the Notifying Party are described in the below section 5.3.8.3 ("Commission's assessment").

<sup>345</sup> See the Notifying Party's response to the Commission's RFI 19, questions 1, 2 and 3.

Even if RHEL clones were to be foreclosed, customers would still have a number of other Linux options to which they could easily switch.

### 5.3.8.3. Commission's assessment

(516) Overall, the Commission considers that, post-Transaction, the Merged Entity will not have the ability and incentive to foreclose the competitive pressure exercised by RHEL clones, either (i) directly by restricting third party's access to RHEL's source code or (ii) indirectly by degrading access to releases of updates and patches for RHEL's source code in such a way that it would effectively become impossible to continue marketing RHEL clones, or (iii) by implementing a combination of (i) and (ii), for the reasons set out below. In any event, the Commission considers that such foreclosure strategy would not have a significant detrimental effect on competition.

#### *Oracle's claim*

(517) The vast majority of the software packages in RHEL are licensed under "copyleft" open source licences that require the distributor of a binary to make the source code of the binary available.<sup>346</sup> Most of these copyleft packages are specifically licensed under the GPL, which contains a detailed requirement that distributors of binary versions provide the complete corresponding source code of the binary.

(518) Oracle does not claim that the Merged Entity would have the ability and incentive to infringe the terms of RHEL's open source licences. Instead, Oracle claims that the GPL that governs the use of the Linux kernel and according to which any derivative works of the Linux kernel code has to be made available does not preclude the Merged Entity from effectively foreclosing Oracle's access to the RHEL source code.<sup>347</sup>

(519) More specifically, Oracle explains that in order to be able to offer a RHEL clone, as it currently does, it is dependant on full and timely access to RHEL's source code.<sup>348</sup> In this respect, Oracle claims that the Merged Entity will have the technical ability to delay or degrade access to RHEL's source code in such a way that it would effectively become impossible to continue marketing RHEL clones.

(520) Oracle further explains that this could be achieved without infringing the GPL by a combination of (i) not making available the source code to third party other than the direct recipients of the binary and/or (ii) degrading access to releases of updates and patches for RHEL's source code, i.e, by changing the method and/or timing for such releases. With respect to the former, Oracle explains that the GPL requires the distributor to provide complete corresponding source code to all direct recipients of the binary, but not necessarily to the public at large. In this respect, Oracle claims that Red Hat's current contract terms "*restrict the customer's ability to share the source code with others*" and that, while so far Red Hat has not done so, the Merged Entity could seek to enforce these contractual

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<sup>346</sup> See the Notifying Party's response to the Commission's RFI 19, question 1.

<sup>347</sup> See minutes of a call with Oracle dated 9 April 2019, paragraph 14.

<sup>348</sup> See minutes of a call with Oracle dated 9 April 2019, paragraph 14.

terms in order to prevent Oracle from accessing RHEL's source code.<sup>349</sup> With respect to the latter, Oracle explains that such behaviours would not infringe the GPL since this open source licence does not provide any specific obligations around the method and timing of sharing updates and patches to the source code.

*As regards the Merged Entity's ability to restrict third party's access to RHEL's source code*

- (521) The Commission considers that it is unlikely that the Merged Entity would have the technical ability to completely foreclose its competitors' access to RHEL's source code through contractual restrictions without infringing the GPL. This is based on the following reasons.
- (522) First, the Commission notes that Red Hat's current practice is to make available the source code for RHEL in two ways: first, Red Hat makes source code available for download to all RHEL distributees (including to enterprise paid customers and to developers, partners and potential customers irrespective of whether such user has a paid subscription), and second Red Hat publishes the RHEL's source code on the publically accessible CentOS project website.<sup>350</sup> Currently, Oracle or any other third party can therefore directly access RHEL's source code on the CentOS project website.
- (523) Second, even if Red Hat was to change its current practice of making RHEL's source code available to the public (as it could do without infringing the GPL), the Commission considers that Red Hat's current contractual terms for the distribution of RHEL would not give Red Hat the ability to restrict third party's access to RHEL's source code since, currently, the only condition for a third party to be contractually allowed to share RHEL's source code with Oracle or any other third party is that all occurrence of Red Hat trademarks should be removed.<sup>351</sup> Oracle or any third party could therefore gain access to RHEL's source code by asking one of the many Red Hat distributees<sup>352</sup> to pass on the RHEL source code, as long as they strip out the Red Hat trademark. In this respect, the Notifying Party states that "*Red Hat's contract terms do not restrict the customer's ability to share the source code with others*"<sup>353</sup> and also specifies that [...].<sup>354</sup>
- (524) Third, the Commission notes that another potential alternative way for Oracle or any other third party to gain access to RHEL's source code in the event where it would not be publicly available any more, could be for Oracle or any other third party to indirectly become a RHEL distributee. In this respect, the Notifying Party explains that "*Oracle or the third party itself, or any of its developers employees, could become a Red Hat customer or developer*" in which case the GPL would

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<sup>349</sup> See minutes of a call with Oracle dated 9 April 2019, paragraph 14.

<sup>350</sup> See the Notifying Party's response to the Commission's RFI 19, question 1.

<sup>351</sup> See the Notifying Party's response to the Commission's RFI 19, question 1.

<sup>352</sup> According to the Notifying Party (see the Notifying Party's response to the Commission's RFI 19, question 1), there are "*millions of RHEL users, including not only thousands of enterprise customers worldwide who purchase a RHEL support subscription in return for a fee, but also over 1.4 million developers, who are entitled to a self-supported, development-only subscription that comes with full access to the code*".

<sup>353</sup> See the Notifying Party's response to the Commission's RFI 19, question 1.

<sup>354</sup> See the Notifying Party's response to the Commission's RFI 19, question 1.



require that it be provided with the complete RHEL source code.<sup>355</sup> For example, an Oracle employee (or someone acting on behalf of Oracle although not an employee) could potentially become part of the community of 1.4 million developers, who are entitled to a self-supported, development only RHEL subscription that comes with full access to the code.<sup>356</sup>

- (525) Fourth, the Commission notes that the Transaction does not increase Red Hat's pre-existing ability to restrict third party's access to RHEL's source code.
- (526) In any case, as explained in the below section, the Commission considers that the Merged Entity will not have the ability and incentive to foreclose the competitive pressure exercised by RHEL clones by withholding or degrading access to RHEL's source code.

*As regards the Merged Entity's ability to foreclose the competitive pressure exercised by RHEL clones by withholding or degrading access to RHEL's source code*

- (527) The Commission considers that the Merged Entity will face similar constraints as Red Hat pre-Transaction in its ability to foreclose access to RHEL's source code.<sup>357</sup> The Commission therefore considers that, post-Transaction, the Merged Entity will not have the ability to foreclose RHEL clones by withholding or degrading access to RHEL's source code for the reasons set out below.<sup>358</sup>
- (528) First, the Commission considers that it is unclear whether the Merged Entity will have the technical capacity to foreclose RHEL clones by degrading access to RHEL's source code. This is in particular based on the fact that, as reported by several market respondents,<sup>359</sup> Red Hat has already undertaken certain actions in the past in order to make access to RHEL's source code more difficult. However, as confirmed by Oracle, these actions have so far not prevented it from offering a RHEL clone.<sup>360</sup>
- (529) More specifically, according to Oracle, in 2009, Red Hat has changed the way in which updates to RHEL's source code were packaged in order to make it more difficult to understand what had changed between subsequent versions of RHEL.<sup>361</sup> However, with respect to this specific Red Hat behaviour, Oracle

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<sup>355</sup> See the Notifying Party's response to the Commission's RFI 19, question 1.

<sup>356</sup> See the Notifying Party's response to the Commission's RFI 19, question 1.

<sup>357</sup> The Commission notes that the analyses of the incentive and the ability to foreclose cannot be easily separated. The considerations discussed below at paragraphs (527) to (542) therefore do not only constraint the Merger Entity's ability to foreclose but also its incentive to do so. Conversely, the considerations discussed at paragraphs (543) and (559) below, do not only constraint the Merged Entity's incentive to foreclose but also its ability to do so.

<sup>358</sup> The Commission considers that the same line of arguments as set out at paragraphs (531) to (559) would similarly apply to any potential concern relating to the foreclosure of the source code of any other open source products of either Red Hat or IBM. The Commission therefore considers that the Merged Entity is unlikely to have the ability and the incentive to significantly harm competition through the foreclosure of the source code of any other open source products of either Red Hat or IBM.

<sup>359</sup> See for example Oracle's email to the case team dated 11 June 2019 and replies to Questionnaire Q1 to competitors, question 65.

<sup>360</sup> See Oracle's email to the case team dated 11 June 2019.

<sup>361</sup> See for example minutes of a call with Oracle dated 9 April 2019, paragraph 13; Oracle's email dated 11 June 2019 and replies to Questionnaire Q1 to competitors, question 64. More specifically, while

explains that, while this was more time consuming, it was able to “*separate patches in a timely enough manner*” without it having a negative impact on its customers.<sup>362</sup> Based on this example, the Commission considers that it is unclear at which point Oracle would lose the technical ability to accommodate changes in the method and /or timing for the release of updates and patches for RHEL’s source code.

- (530) However, since the GPL does not provide for any specific obligations with respect to the method and/or timing for the release of RHEL’s source code, the Commission also notes that the Merged Entity could in theory decide to impose even more drastic changes in order to effectively prevent Oracle or any other competitors from offering RHEL clones. In particular, Oracle notes that a delay in its access to updates and patches for RHEL’s source code could expose its customers to “*catastrophic security issues*”. Oracle further explains that such a delay would prevent it from continuing to offer its RHEL clone.<sup>363</sup> However, Oracle does not provide further details (i) on the concrete actions that the Merged Entity could potentially carry out in order to delay access to RHEL’s source code, and (ii) on the reasons why Oracle would not have the technical ability to accommodate such actions in a way that would make it possible for Oracle to continue offering its RHEL clone.
- (531) Second, even if the Merged Entity could deteriorate access to RHEL’s source code to the extent where it would become impossible to offer a RHEL clone, the Commission considers that the Merged Entity would not have the ability to drive competitors currently relying on a RHEL clone out of the market for paid Linux-based server operating systems since these competitors could always continue competing with a forked Linux distribution based on RHEL.
- (532) In this respect, Oracle indicates that, in the event where it would not get full and timely access to RHEL’s source code any more, it would react by developing its own forked version of RHEL.<sup>364</sup> Any other vendors relying on a RHEL clone could therefore likely also decide to no longer rely on RHEL updates, patches, and fixes, and develop its own technical solutions.
- (533) Oracle however claims that the constraint it would be able to exercise on RHEL would be significantly reduced since the switching costs that customers would have to incur for switching from RHEL to such a forked Linux distribution would be significantly higher.
- (534) As explained above at paragraph (402), on the issue of switching, the Commission acknowledges that efforts are required to switch from one Linux OS to another one. However, based on its market investigation (see above paragraphs (402) and (404)), the Commission considers that switching is feasible and that the threat of customers switching away from RHEL to alternative Linux distributions would most likely make any type of exclusionary practice leveraging RHEL not profitable and in any event ineffective in foreclosing rivals.

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Red Hat had previously released updates in clearly identifiable individual fixes/patches, in 2009, Red Hat allegedly changed this method and started to provide fixes/patches in an undifferentiated mass.

<sup>362</sup> See Oracle’s email to the case team dated 11 June 2019.

<sup>363</sup> See minutes of a call with Oracle dated 9 April 2019, paragraph 14.

<sup>364</sup> See for example reply to Questionnaire Q1 to competitors, question 61.

- (535) This view is shared by the Notifying Party, which explains that “*even if Oracle or another vendor relying on a RHEL clone had to create its own forked distribution of RHEL (which it does not have to do), it would in no way affect customers' ability to switch to Oracle Linux or to another forked distribution of RHEL as a competitive alternative*”.<sup>365</sup> In particular, the Notifying Party argues that, contrary to Oracle’s allegation, while it is true that Oracle Linux is based on RHEL, already today Oracle Linux is not a perfect clone of RHEL and switching from RHEL to Oracle Linux would require some adjustments. In addition, the Notifying Party confirms that, while switching existing workloads from one Linux OS to another always requires some level of effort in terms of application reinstallation and testing, switching does routinely occur.<sup>366</sup> In the same vein, the Notifying Party states that “*entreprise customers can and do switch among Linux distributions without significant difficulty*”<sup>367</sup> and it identifies a number of examples of large companies having performed a complete switch from RHEL to SUSE including for existing and new workloads. These companies include [...].<sup>368</sup>
- (536) In line with the Notifying Party’s view, the Commission notes that, as explained above at paragraphs (402) to (404), even if most customers having responded to the Commission’s market investigation consider that switching from one Linux OS to another would not be easy or may even be very difficult, many customers however explain that it is feasible and some state that they would consider it on a case by case basis assessing costs and benefits of doing so.<sup>369</sup> In particular, with respect more specifically to switching away from a RHEL clone, a large customer which is also a competitor of the Parties on certain markets, has indicated that, while it is currently using a RHEL clone for its servers (i.e., CentOS which is the community, free version of RHEL), if following the Transaction, this RHEL clone was to become unavailable, it would be able to switch to a different Linux distribution. This customer/competitor however indicates that such a switch would be costly.<sup>370</sup>
- (537) Third, in any event, in addition to the potential new forked versions of RHEL, there are several alternative paid Linux distributions which do not depend on RHEL’s source code in the same extent as Oracle Linux currently does and which could continue being credible alternatives to RHEL even in the event where the Merged Entity would attempt to foreclose access to RHEL’s source code.
- (538) As explained above at paragraph (392), this is in particular the case for SUSE’s SLES which has a [10-20]% market share on the paid Linux-based server operating systems market and Canonical’s Ubuntu whose market share is equivalent to Oracle’s market share at a level of around [5-10]%. Indeed, as also explained at paragraphs (402) to (404), a number of customers see these paid Linux distribution as credible alternatives to RHEL and there are regular examples of customers switching from RHEL to these alternative distributions. In addition, as explained by one competitor in its response to the Commission’s

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<sup>365</sup> See the Notifying Party’s response to the Commission’s RFI 19, question 3.

<sup>366</sup> See the Notifying Party’s response to the Commission’s RFI 19, question 3.

<sup>367</sup> See the Notifying Party’s response to the Commission’s RFI 19, question 3.

<sup>368</sup> See the Notifying Party’s response to the Commission’s RFI 19, question 2.

<sup>369</sup> See replies to Questionnaire Q2 to customers, questions 41 and 44.

<sup>370</sup> See replies to Questionnaire Q1 to competitors, question 62.

market investigation, by contrast with Oracle Linux which is described as a “*RHEL derivatives*”, SUSE’s SLES and Canonical’s Ubuntu are described as “*more independent of RHEL*”.<sup>371</sup>

- (539) With respect specifically to SUSE, the Commission notes that while, SUSE offers a service (i.e. SUSE Linux Enterprise Server with Expanded Support) based to a certain extent on RHEL’s source code, this service is only an ancillary service aimed at facilitating the migration towards SUSE’s own SLES Linux distribution. With respect to this specific service, the Notifying Party explains that it essentially consists in SUSE’s marketing updates and fixes to its customers that are compatible with both SUSE and RHEL so that customers can “*purchase a one-stop-shop Linux OS support subscription and keep access to full commercial support for both RHEL and SUSE*”.<sup>372</sup> In this regard, the Notifying Party considers that SUSE’s ability to offer such a service for its customers using both RHEL and SLES does not depend on the availability of RHEL’s source code. Indeed, the Notifying Party states: “*the availability of the RHEL source code is in no way a requirement for SUSE to provide this one-stop-shop service to customers*”.
- (540) With respect specifically to Canonical, while Canonical’s own Linux distribution relies to some extent on RHEL’s source code, by contrast with Oracle Linux, it cannot be considered as a RHEL clone since Ubuntu is largely based on Canonical’s own technology.<sup>373</sup> In addition, while Canonical considers that any delay or deterioration in accessing RHEL’s source code would represent a challenge that it would need to overcome, in response to the Commission’s market investigation, Canonical also indicates that it expects that, as a result of the Transaction, certain RHEL customers may be more willing to consider alternative Linux distributions and that this may create additional business opportunities for Ubuntu.<sup>374</sup>
- (541) In any event, if SUSE and Canonical’s access to RHEL’s source code was to become more difficult post-Transaction, the Commission considers likely that, similar to Oracle (see above paragraphs (531) to (536)), SUSE and Canonical could fork the specific component of RHEL’s source code that they currently use for their own Linux distribution in order to stop relying on RHEL’s input.
- (542) Overall, the Commission therefore considers that, even if the Merged Entity was to engage in a strategy aimed at foreclosing to a certain extent access to RHEL’s source code, there would still be sufficient credible alternatives for customers willing to switch away from RHEL since (i) even if Oracle or another vendor relying on a RHEL clone had to create its own forked distribution of RHEL, these vendors would still constitute credible alternatives for customers willing to switch away from RHEL (see above paragraphs (531) to (536)) and (ii) several alternative paid Linux distributions which do not depend on RHEL’s source code

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<sup>371</sup> See replies to Questionnaire Q1 to competitors, question 41.

<sup>372</sup> See the Notifying Party’s response to the Commission’s RFI 19, question 3.

<sup>373</sup> See the Notifying Party’s response to the Commission’s RFI 19, question 2. See also replies to Questionnaire Q1 to competitors, question 41.

<sup>374</sup> See Canonical’s response to question 67: “*However, some enterprise will be more inclined to look for an alternative to RHEL given the association with IBM*”.

in the same extent as Oracle Linux currently does would continue being credible alternatives to RHEL.

*As regards the Merged Entity's incentive to foreclose the competitive pressure exercised by RHEL clones by withholding or degrading access to RHEL's source code*

- (543) The Commission considers that the Merged Entity will face similar constraints as Red Hat pre-Transaction in its incentive to foreclose access to RHEL's source code. The Commission therefore considers that, post-Transaction, the Merged Entity will not have the incentive to foreclose RHEL clones by withholding or degrading access to RHEL's source code for the reasons set out below.
- (544) First, the Commission considers that the current constraint exercised by the risk that any attempt from Red Hat to foreclose RHEL's source code would trigger a negative reaction from the developer community and/or RHEL's clients resulting in a significant detrimental impact on Red Hat's business will continue to apply to the Merged Entity post-Transaction. This is based on the following reasons.
- (545) In the first place, Oracle and other competitors have indicated in response to the Commission's market investigation that, in 2009, Red Hat has already undertaken concrete steps in order to make access to RHEL's source code more difficult (see above paragraph (529)). However, as also explained at paragraph (529), this strategy has not prevented RHEL's competitors from offering RHEL clones. According to Oracle, the main reason why Red Hat has been unable to foreclose access to RHEL's source code is that such behaviour has been *"so far tempered by severe reactions from the open source community"*.<sup>375</sup>
- (546) In the second place, all competitors having expressed their view confirm that, if the Merged Entity were to change Red Hat's current commitment towards open source this would trigger a reaction from the open source community. In particular a number of competitors consider that the adverse effect on the Merged Entity's business would be very significant or significant.<sup>376</sup> One of them (which is also a large customer), for example, states *"IBM appears to be chasing the open-source community with this planned acquisition, and Red Hat's business depends on the open-source community in order to function. Losing their support would be incredibly detrimental"*<sup>377</sup> while another one states *"Red Hat would become another proprietary vendor and lose the power with the community, who they depend on for contributions back to the open source code. Innovation within*

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<sup>375</sup> See Oracle's replies to Questionnaire Q1 to competitors, questions 39 and 66. See also minutes of a call dated 9 April 2019 with Oracle, paragraph 13. See also the also the following similar statement from the Notifying Party: *"even if Red Hat could interfere with Oracle's access to RHEL source code under the GPL, it has not done so pre-merger because of its dependency on the community of open source developers, which will continue post-merger"* (see Notifying Party's reply to RFI 19, question 1).

<sup>376</sup> While certain competitors (e.g. Oracle) consider that the detrimental effect on the Merged Entity would be "limited", these responses seem to be mainly based on the large scale of IBM which would enable to Merged Entity to better weather any negative reaction from the open source community. With respect to this argument, the reasoning sets out at paragraphs (557) to (559) in relation to Oracle's specific claim applies *mutatis mutandis*.

<sup>377</sup> See replies to Questionnaire Q1 to competitors, question 65.

*the merged entity would slow and other open source vendors would gain marketshare.*<sup>378</sup>

- (547) In addition, in line with the above competitors' feedback, all the open source foundation that have responded to the Commission's market investigation consider that, if the Merged Entity were to change Red Hat's current commitment towards open source this would trigger a reaction from the open source community.<sup>379</sup> As explained in more details below at paragraph (568), open source foundations host key open source projects and the Commission therefore considers that they are likely to have a broad insight on how the open source community could be expected to react.
- (548) As apparent from their responses to the Commission's market investigation, in line with the Notifying Party's claim, open source foundations expect that any modification of Red Hat's open source participation could significantly impair the value of IBM's investment in Red Hat. In particular, one of them indicates that it would expect the adverse effect on the Merged Entity's business to be very significant based in particular on the high risk that a large number of Red Hat's key developers would leave the company, as apparent from the following statement: *"Well, if Red Hat's developers leave en masse it would mean that the money spent to acquire Red Hat would have been completely wasted. I would assume that the most likely outcome from that scenario would be bankruptcy of IBM"*.<sup>380</sup>
- (549) Similarly, while another one considers that the adverse effect on the Merged Entity would be overall limited, this foundation clarifies that this is because of the relatively limited share that Red Hat will represent in the Merged Entity's total turnover. With respect specifically to the effect on Red Hat's business, that foundation confirms that the effect could be significant: *"however the impact could well be significant for the portion of the merged entity's overall business corresponding to Red Hat"*.<sup>381</sup>
- (550) Finally, a third one considers highly unlikely that the Merged Entity would become less "open" as a result of the Transaction. In this respect, it states the following: *"having worked with both groups extensively (IBM and Red Hat) I consider it highly unlikely that the merged entity will do anything to lessen the "openness" Indeed I expect they will be at pains to ensure the resultant entity is - more- open than less"*.<sup>382</sup>
- (551) In the third place, the Notifying Party has repeatedly stressed the importance of the open source community's support for Red Hat's business and the dramatic impact that antagonizing such community could have on Red Hat's business. For example, the Merged Entity explains that it is *"vital for Red Hat (and post-Transaction, IBM) to maintain its good standing with the developer community"* since *"any attempt to affect the neutrality or openness of RHEL would alienate*

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<sup>378</sup> See replies to Questionnaire Q1 to competitors, question 65. A number of other similar statements can be found in the competitors' responses to question 64 and 65.

<sup>379</sup> See replies to Questionnaire Q3 to open source foundations, question 6.

<sup>380</sup> See replies to Questionnaire Q3 to open source foundations, question 7.

<sup>381</sup> See replies to Questionnaire Q3 to open source foundations, question 7.

<sup>382</sup> See replies to Questionnaire Q3 to open source foundations, question 6.

*many of the key developers (both within Red Hat and outside) upon whom Red Hat relies for its commercial offerings”.*<sup>383</sup>

- (552) In the same vein, the Notifying Party explains that it has all the incentive to share the source code of its products with the “upstream” developer community in a timely manner since Red Hat needs the input of this community to maintain and further develop its products. For example, the Notifying Party explains that “*given the small percentage of Linux code actually developed by Red Hat, continued developer mindshare is the single most important asset for Red Hat to ensure the continued success of RHEL and other Red Hat products and timely sharing of code is critical to this*”.<sup>384</sup>
- (553) Second, the claim that the Merged Entity would have an incentive to delay or degrade access to RHEL’s source code does not seem supported by IBM’s rationale for the Transaction as stated in the Recitals in the Agreement and Plan of Merger and [...].<sup>385</sup>
- (554) Indeed, as explained in more details above at paragraph (401), the Commission acknowledges that IBM has made firm, public commitments to maintain and continue Red Hat’s open source business model and its neutral “Switzerland” strategy in working with third parties. In addition, internal documents provided to the Commission show that [...].
- (555) Third, Oracle claims that, unlike Red Hat, post-Transaction the Merged Entity will have the ability and incentive to foreclose Oracle’s access to RHEL’s source code essentially because the Merged Entity’s more diversified business will allow it to “*weather any temporary backlash better than Red Hat alone, which is dependent on RHEL support revenues*”.<sup>386</sup> With respect to this backlash, Oracle acknowledges that a “*developer backlash*” could be expected. However, it argues that a “*customer backlash*” is unlikely since “*enterprise customers who pay support are generally indifferent to whether vendors are open source or not*”.<sup>387</sup> In addition, Oracle argues that the merged entity will have “*an extra incentive to undermine Oracle Linux by blocking access to RHEL’s code*” since “*Oracle Linux helps Oracle compete with IBM in servers, middleware and database management systems*”.<sup>388</sup>

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<sup>383</sup> See the Notifying Party’s response to the Commission’s RFI 19, question 1.

<sup>384</sup> See the Notifying Party’s response to the Commission’s RFI 19, question 1.

<sup>385</sup> See for example the Agreement and Plan of Merger by and among International Business Machines Corporation, Socrates Acquisition Corp. and Red Hat, Inc. dated October 28, 2018. IBM agreed to operate Red Hat as a distinct business unit and that Red Hat would “*remain an open and neutral platform, partnering broadly with information technology participants [...] and continuing to support the open source community*”.

<sup>386</sup> See Oracle’s reply to Questionnaire Q1 to competitors, question 39 and minutes of a call with Oracle dated 9 April 2019, paragraph 16.

<sup>387</sup> See minutes of a call dated 9 April 2019 with Oracle, paragraph 15.

<sup>388</sup> See minutes of a call with Oracle dated 9 April 2019, paragraph 15. In its response to Questionnaire Q1 to competitors, question 39, Oracle also claims that its concerns are “*exacerbated*” by IBM’s ability to influence decisions through its “*massive consulting business*”. With respect to this argument as explained at the above paragraph (467) and followings, the Commission considers that the Merged Entity will not have the ability to significantly influence customers’ purchasing decisions in favour of Red Hat products and to the detriment of competing vendors’ products, let alone significantly foreclose access to a sufficient customer base to Red Hat’s competitors, for the following reasons.

- (556) The Commission considers that this specific claim from Oracle can be rejected based on the following reasons.
- (557) In the first place, as explained above at paragraphs (544) to (552), based on its market investigation, the Commission considers that if, post-Transaction, the Merged Entity was to foreclose access to RHEL's source code this would likely have a significant detrimental effect on Red Hat's business. While certain competitors having responded to the Commission's market investigation consider that customers do not attach too much importance to whether a product is open source or not as long as it delivers the functionalities they need and would therefore not necessarily switch away if RHEL was to become less open source, a number of other competitors consider that, if the Merged Entity was to deviate from Red Hat's current commitment to open source, there would likely be customers switching to other open source alternatives.<sup>389</sup> In any case, in line with the feedback of several market participants, the negative reaction from the open source community alone could already have a significant detrimental impact on Red Hat's business since, as explained in more details at paragraphs (544) to (552), Red Hat's business relies to a great extent on contributions from the open source community.<sup>390</sup>
- (558) In the second place, it is unlikely that a strategy aimed at foreclosing RHEL clones by preventing access to RHEL's source code could be leveraged in order to capture sufficient additional sales so as to offset the detrimental effect attached to such a foreclosure strategy (see above paragraph). In particular, it is unlikely that such a foreclosure strategy would enable the Merged Entity to advantage its hardware and software products by degrading the interoperability of competing products with RHEL since, as explained above at paragraphs (531) to (542), customers will likely still be able to use third party hardware and software products in combination with a number of alternative paid Linux operating systems. This is for example the case for Oracle's servers, middleware and database management systems. If the Merged Entity was to (i) foreclose access to RHEL's source code and (ii) limit the interoperability of these Oracle products with RHEL, customers could still use these products in combination either with Oracle's forked version of RHEL or with other paid Linux operating systems such as SUSE's SLES or Canonical's Ubuntu.
- (559) In the third place, while Oracle acknowledges that a strategy aimed at preventing Oracle Linux from using RHEL's source code would involve a certain degree of "backlash" in particular on the part of developers, Oracle does not explain why it considers that this "backlash" would be only temporary and why, in spite of this "temporary backlash", the Merged Entity would still find it profitable to engage in the foreclosure of RHEL's source code. In particular, Oracle does not explain how the foreclosure of Oracle Linux as a RHEL clone could provide a leverage

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<sup>389</sup> See replies to Questionnaire Q1 to competitors, questions 62 and 64. For example: "*customers would look to other open source alternatives. Other players would take leadership roles in advancing open source projects for the benefit of the community (as Red Hat does today)*".

<sup>390</sup> See replies to Questionnaire Q1 to competitors, question 64. For example: "*As mentioned in the previous response, it seems that one of the drivers of IBM's planned acquisition of Red Hat is access to the large and passionate open source community. Changing the current commitment would elicit strong negative pushback from the community. Therefore we do not think this is likely*" or "*in our view, Red Hat's strength is having community support since they do not create their own products*".



allowing to capture additional IBM sales of such an amount that it would overall give the Merged Entity the incentive to engage in the foreclosure of RHEL's source code.

*As regards effect*

- (560) The Commission considers that, in any event, a potential foreclosure strategy targeting RHEL clones would have no significant effect on competition. This is because, as explained at paragraphs (544) to (542), even if the Merged Entity was to effectively prevent RHEL clones by foreclosing access to RHEL's source code, customers would still have sufficient alternatives that they could switch to. In particular, customers could switch to alternative paid Linux distributions that are not RHEL clones (mainly to SUSE's SLES or Canonical's Ubuntu). Customers could also switch to Oracle's forked version of RHEL or to any other potential forked version developed by other vendors relying on a RHEL clone.
- (561) The Commission therefore considers that, even if RHEL clones were to be foreclosed, this would not result in a significant increase in RHEL's market power. In line with the conclusion at the above paragraph (390), the Commission therefore considers that the Merged Entity will most likely not have a sufficient degree of market power to leverage its position with RHEL to foreclose competitors in other markets.

#### **5.4. Effects on open source innovation**

##### **5.4.1. Potential concern**

- (562) There are hundreds of thousands of open source projects which, to different degrees, may serve as input into current and future commercial products of third parties. Red Hat contributes to thousands of these open source projects while IBM contributes to approximately [...] projects.
- (563) Some third party commercial software products that derive from open source projects in which IBM and/or Red Hat are involved may compete with existing IBM/Red Hat products. Some other commercial software products may also at some point be developed on the basis of some of these projects to compete with the Parties. Therefore, the question arises whether the Merged Entity may have the ability and incentive to delay the development of some of these projects or otherwise redirect them to reduce the emergence of competing products or reduce the competitive pressure of existing products.
- (564) While the Commission has not received any formal complaint with respect to this theory of harm, a few respondents to the Commission's market investigation identified open source projects for which they consider that the influence that the Merged Entity will hold post-Transaction could potentially raise a concern. These open source projects are the followings: Cloud Foundry, Eclipse Microprofile, and systemd. The potential concerns related to these projects are described and assessed below at paragraph (582) and followings.

##### **5.4.2. Notifying Party's view**

- (565) The Notifying Party submits that the Transaction will not give rise to any potential anticompetitive concerns in relation to open source innovation since:

- (a) IBM has publicly stated its intention to continue the independent open source approach to product development that has made Red Hat so successful;<sup>391</sup>
- (b) the Transaction will not give IBM decisive “influence” or “control” over the activities or the strategic direction of strategic open source projects in which IBM and/or Red Hat are currently involved;<sup>392</sup>
- (c) in any event, the open source community of developers would fork the project if it were unhappy with the direction taken and if there was market interest in the fork (which would presumably be the case if the fork could lead to a commercial product which would divert sales away from an incumbent);<sup>393</sup>
- (d) any modification of Red Hat’s open source participation would result in developers simply “*voting with their feet*”<sup>394</sup> and moving to a new firm, significantly impairing the value of IBM’s investment; and
- (e) with respect to the specific open source projects identified by market participants as potential concerns, the Transaction will not give the Merged Entity the ability and the incentive to steer the direction of these projects to advantage the Merged Entity’s commercial products.<sup>395</sup>

### 5.4.3. Commission assessment

#### 5.4.3.1. As regards the general theory of harm

- (566) The Notifying Party distinguishes open source projects in which Red Hat and IBM are currently involved between projects that are “maintained” by either IBM or Red Hat and projects that are “maintained” by third parties. Open source projects are typically maintained by the original publisher of the project (i.e., of the working code base) until the stewardship is transferred to another individual or group. Where a project has a single “maintainer”, the maintainer can typically decide on the direction for the main technical aspects of the project. The “maintainer” will however often invite contributions and commentary from the community surrounding the project and third party contributors may also steer the direction of particular technical sub-areas.
- (567) Each of Red Hat and IBM have provided a list of open source projects that they consider as the most relevant/strategic for their business.<sup>396</sup> Within these lists, Red Hat and IBM have respectively identified [...] projects which they consider

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<sup>391</sup> See Form CO, paragraphs 42-44.

<sup>392</sup> See Form CO, paragraph 1121 and followings. See also the Notifying Party’s response to the Commission’s RFI 19, question 5.

<sup>393</sup> See Form CO, paragraph 205 and followings.

<sup>394</sup> See Form CO, paragraph 204.

<sup>395</sup> See the Notifying Party’s response to the Commission’s RFI 19, question 5.

<sup>396</sup> Red Hat has provided a list of [...] open source projects which it considers as being significant to Red hat’s commercial products and where Red Hat is a material contributor to a significant code base. IBM has provided a list of [...] projects in which IBM is actively promoting and investing as IBM believes that future product developments may be based on these projects (see Form CO, Annex – Pre-Notification RFI 3 – 4).

as “maintained” by Red Hat (out of a total of [...] strategic projects) and [...] projects which they consider as “maintained” by IBM under the IBM open source governance model<sup>397</sup> (out of a total of [...] strategic projects). The remaining projects on IBM and Red Hat’s lists are maintained by third parties.

- (568) Among the projects that are maintained by third parties, a number – typically the larger ones – are governed by open source foundations under a formal set of rules. Such formal structures are implemented to provide open source projects with the organization needed to create an effective solution, while maintaining the benefits of a community project. The Linux Foundation, the Apache Software Foundation, and the Eclipse Foundation are examples of non-profit open source “foundations” that provide formal governance and support for popular community projects. One open source foundation can host a large number of open source projects. This is for example the case for the Eclipse Foundation which administers 380 open source projects.
- (569) Overall, the Commission considers that the Merged Entity will not have the ability and incentive to delay the development of open source projects it is involved in or otherwise redirect them to reduce the emergence of competing products or reduce the competitive pressure of existing products. This is based on the following general reasons and on the specific reasons set out below at paragraphs (583) to (602).
- (570) First, with respect to open source projects that are currently maintained by either Red Hat or IBM or for which either IBM or Red Hat is a large contributor, the current ability of each of the Parties to steer the direction of these projects will not increase further because of the Transaction.
- (571) Second, based on the Parties’ best estimates,<sup>398</sup> IBM and Red Hat’s contributions to source code only overlap for [...] <sup>399</sup> out of their [...] most relevant/strategic projects. For [...] out of these [...] overlapping projects, the Notifying Party submits that the Merged Entity will have “*no greater influence*” following the

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<sup>397</sup> IBM open governance model is IBM’s effective strategy to attract developers and IT industry players to a single open source project with the objective of attaining momentum faster. It looks to avoid community fragmentation and ensures the commitment of IT industry players.

<sup>398</sup> For the purpose of estimating their share of contributions in open source projects the Parties have used GitHub as primary source of data as they believe that it is the most comprehensive repository of open source projects to which they contribute. Red Hat’s contribution percentages have been calculated for the time period from January 2014 until March 28, 2019 using the following formula: Percentage of Red Hat Contributions = Red Hat Project Commits/All Project Commits. With respect to IBM, IBM’s contribution rates represent the percentage of the total committers (as opposed to the number or the percentage of commits) that have the ibm.com domain in their email addresses. In particular, IBM has a script that gathers the commit logs from GitHub repositories of the relevant project, scans the data for the author/commmitter email and examines the domain, and then summarizes contributions by top level domain (e.g., ibm.com). IBM examined the period beginning January 1, 2018 through Friday, April 19, 2019. For the Swift Storlets project, an OpenStack project listed in tab 2, IBM estimated its share of contribution by using the contribution data published on stackalytics.com. The Parties note that while they have endeavoured to provide their best estimates, the share of contribution for some of the projects may be underestimated as Red Hat and IBM developers do not always disclose their Red Hat or IBM email addresses on GitHub. In particular, Red Hat indicates that the contribution shares may significantly understate Red Hat’s contribution share for at least the following projects: [...]. See Form CO, paragraphs 1115 to 1120.

<sup>399</sup> These projects are: [...].

Transaction.<sup>400</sup> In this respect, the data provided by the Notifying Party confirms that the increment of contribution share represented by IBM is limited for the large majority of the overlapping projects since, among the [...] overlapping projects, the incremental share of contribution represented by IBM is only above [5-10]% for [...] projects.<sup>401</sup> For [...] out of these [...] projects, the Notifying Party explains that despite the overlap in contribution share, the Merged Entity will have “*no greater influence*” in these projects following the Transaction since IBM’s contributions are only occasional and/or limited to the maintenance of specific IBM system offerings. There is only one project for which the Notifying Party acknowledges that the combination of IBM and Red Hat will result in increased influence, i.e., the [...] open source project. However, as explained below at paragraph (589) and followings, the Commission considers that the Parties’ combined influence in this project does not raise competitive concerns.

(572) Third, several open source projects in which IBM and/or Red Hat are involved are under the umbrella of an open-source foundation that serves as a check against behaviours that might seek to concentrate influence over the project in one contributing entity.<sup>402</sup> IBM and/or Red Hat are members in a number of these foundations and may hold certain role in the governance bodies of these foundations or in specific committees and groups within these foundations.

(573) In this respect, the Parties identify two major foundations in which they both currently hold a board seat, i.e., the Eclipse Foundation and the Cloud Native Computing Foundation (“CNCF”).<sup>403</sup> While the rules addressing affiliation conflicts may differ from one open source foundation to the other, the bylaws of both the Eclipse Foundation and the CNCF preclude multiple representatives. As confirmed by the Notifying Party,<sup>404</sup> the Parties will therefore have to give up one of their seats on the boards of both the Eclipse Foundation and the CNCF. In response to the Commission’s market investigation, another open source foundation hosting certain projects in which Red Hat and/or IBM are involved, also indicated that, following the Transaction, Red Hat will no longer be able to maintain a separate membership in its foundation.<sup>405</sup>

(574) Fourth, the Commission notes that the large majority of the competitors having replied to the its market investigation are generally not concerned with the influence that the Merged Entity will have in open source projects. Indeed, in

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<sup>400</sup> There is only one project for which the Merged Entity acknowledges that the Merged Entity will increase its influence following the Transaction, i.e., the [...] project. A specific assessment of this project is set out below at paragraph 592 and followings.

<sup>401</sup> These projects are the followings: [...].

<sup>402</sup> E.g., among the overlapping projects [...] is hosted by the [...] Foundation, [...] is hosted by the [...] Foundation, [...] is hosted by the [...] Foundation, [...] is hosted by the [...], [...] is hosted by the [...] Foundation, [...] is hosted by the [...] Foundation, etc.

<sup>403</sup> While they do not both hold a board seat, the Parties also overlap to some extent in the Linux foundation and in the Apache Software Foundation. In the Linux foundation, IBM holds the highest (Platinum) membership level and a seat on the Linux Foundation board while Red Hat has a lower (Silver) membership level and does not have a board seat. As to the Apache Software Foundation, while a Red Hat employee serves on its board, IBM’s employees do not. The President of the Apache Software Foundation is an IBM executive but he does not serve on the Apache Software Foundation’s board.

<sup>404</sup> See Form CO, paragraphs 1150 and 1156. Also confirmed by the Eclipse Foundation (see Eclipse Foundation’s reply to Questionnaire Q3 to open source foundations, question 4).

<sup>405</sup> See replies to Questionnaire Q3 to open source foundations, question 4.

response to the Commission’s market investigation, a large majority of the competitors indicated that they are not involved in any open source projects for which either Red Hat or IBM have the ability to unilaterally adopt decisions having a significant impact on the direction of the relevant project(s).<sup>406</sup> A large majority of competitors also responded that they are not involved in certain open source projects for which, following the Transaction, the combined IBM/Red Hat entity will gain the ability to unilaterally adopt decisions having a significant impact on the direction of the relevant project(s).<sup>407</sup>

(575) Fifth, even for projects for which the Merged Entity may have some degree of influence allowing it to steer the direction of a given project to some extent, the merged entity will likely not be able to impose a direction advantaging its commercial offering to the detriment of third parties because of the threat of forking and the threat of other developers (contributors) walking away from the project, which would significantly damage the project at stake.

(576) Open source software is typically governed by broad copyright licenses that permit the software’s source code to “*be freely accessed, used, changed, and shared (in modified or unmodified form) by anyone*”.<sup>408</sup> Because the source code is freely available, developers are therefore, in theory, free to “fork” any open source community project if they are unhappy with the direction in which a project is going. Similarly, IT vendors could, in theory, “fork” the code of any open source project to develop their own commercial offerings.

(577) In this respect, there are a number of actual examples of notable forks, a number of which have been in direct response to actions taken by a projects’ leadership or sponsor that were seen as potentially impinging on innovation or commitment to open source community norms.<sup>409</sup> These examples include complex projects which shows that, even though, as also acknowledged by the Notifying Party, the easiness of forking depends on the complexity of the software product and related source code, forking can be a possibility even in the case of complex open source projects. Based in particular on these past examples and on their detrimental impact for the original project that have been forked, the Notifying Party claims

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<sup>406</sup> See replies to Questionnaire Q1 to competitors, question 62.1. For the large majority, these competitors did not provide a detailed explanation of their responses. It may therefore be that they are not involved in any of the projects identified by the Notifying Party as “maintained” by either Red Hat or IBM, or it may also be that they are involved in such projects but nonetheless consider that even if Red Hat and/or IBM would have the ability to steer the influence of a given open source project, Red Hat and/or IBM would not have the incentive to do so (e.g. because they wish to encourage third party contributions).

<sup>407</sup> See replies to Questionnaire Q1 to competitors, question 62.2.

<sup>408</sup> See <https://opensource.org/faq#osd>.

<sup>409</sup> MariaDB was forked from MySQL in 2009 after Oracle acquired Sun and degraded MySQL, by stopping offering the cheapest subscription levels for MySQL and holding back test cases in the latest release of MySQL instead of feeding them back into the open source community; Jenkins was forked from Hudson in 2011 after Oracle applied for a trademark on Hudson and did not support the community’s desire to migrate hosting of Hudson from Oracle’s Java net site to GitHub; LibreOffice was forked from OpenOffice.org in 2010 after development slowed under Oracle’s stewardship and Oracle antagonized the community; X.Org was forked from XFree86 in 2004 after XFree86 changed its licensing terms, adding a restriction that required redistributions to explicitly acknowledge XFree86; OpenSSH was forked from SSH in 1999 after the original creator of SSH founded a company to profit from SSH, and licenses for SSH became increasingly restrictive. See Form CO, paragraph 206.

that “*The threat of forking underpins why IBM will have no ability or incentive to limit Red Hat's neutrality (e.g., favoring changes that support IBM products over those of competitors) or its commitment to work within the norms of open source development*”.<sup>410</sup>

- (578) As regards forking, the Commission’s market investigation confirms that it could be an option at least for certain open source projects in which Red Hat and/or IBM are involved.<sup>411</sup> For example, as explained above at paragraph (532), Oracle indicates that, if its full and timely access to RHEL’s source code was hampered by the Merged Entity, it would create its own forked version of RHEL. Another competitor also indicate that, following the rejection of changes that it had proposed to an open source project in which Red Hat was one of the key participant, it has been able to fork the code of the relevant project into an alternative project.<sup>412</sup>
- (579) However, competitors having provided their views on this topic also flag that forking can only be the last resort given the investment and the time required in order to fork a complex open source project.<sup>413</sup> Competitors further explain that there are potentially significant barriers that need to be overcome such as finding developers with the required technical knowledge or building sufficient trust in order to become an “enterprise grade” alternative (which includes *inter alia* building a support team).<sup>414</sup> Finally, competitors also indicate that for a large, complex project to be forked it would need the involvement of one or even several large market players.
- (580) Sixth, even for projects where a fork may be unlikely to occur, the Merged Entity will still remain constrained to some extent by the risk to lose the support of the open source community. Indeed, as explained above at paragraphs (544) to (552), competitors and open source foundations having replied to the Commission’s market investigation consider that, if the Merged Entity was to disregard Red Hat’s legacy commitment to “open source”, this could result in key developers leaving the company and external contributors refraining from inputting in Red Hat’s key projects. Given that Red Hat’s business is entirely based on open source products, losing the support of the open source community could have a significant detrimental on the future development of Red Hat’s products. As explained above at paragraph (548) this could in turn significantly impair the value of IBM’s investment in Red Hat.
- (581) Seventh, as explained above at paragraphs (401) and (554), IBM has made firm, public commitments to maintain and continue Red Hat’s open source business model. [...].<sup>415</sup>

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<sup>410</sup> See Form CO, paragraph 208.

<sup>411</sup> See replies to Questionnaire Q1 to competitors, question 63.

<sup>412</sup> See replies to Questionnaire Q1 to competitors, question 62.

<sup>413</sup> See replies to Questionnaire Q1 to competitors, question 63.

<sup>414</sup> See replies to Questionnaire Q1 to competitors, question 63.

<sup>415</sup> There is nothing in the Commission’s case file which suggests that the Transaction’s business plan would be premised on IBM making Red Hat’s products less open source than they are today. By contrast, as apparent from the Parties’ internal documents which are listed in the above footnote (284), [...] (see footnote (284)). By way of example, [...].

#### 5.4.3.2. As regards the specific concerns

(582) With respect to the specific potential concerns identified by a few competitors having responded to the Commission’s market investigation, the Commission considers that the Merged Entity will not have the ability and incentive to delay the development of these specific projects or otherwise redirect them to reduce the emergence of competing products or reduce the competitive pressure of existing products.<sup>416417</sup> This is based on the general reasons set out at the above paragraphs (575) to (581) and on the following specific reasons.

#### *As regards Cloud Foundry*

(583) A respondent expressed the concern that IBM could use its influence within the Cloud Foundry community in order to change the direction of this project in a way that would advantage OpenShift, [...].<sup>418</sup> In particular, Post-Transaction, the Merged Entity would have no incentive to keep improving Cloud Foundry as an improved Cloud Foundry would potentially create stronger competitors for OpenShift.

(584) Cloud Foundry is one of the open source container orchestrator technology which is used by commercial vendors to offer container infrastructure software. Other orchestration technology include Kubernetes, Docker, Swarm, Apache Mesos. Among these orchestration technologies, Kubernetes is the leader and de facto standard.<sup>419</sup> As explained above at paragraphs (119) to (123), both Red Hat, with OpenShift, and IBM offer container infrastructure software based on the Kubernetes orchestration technology. With respect to the commercial products that are based on Cloud Foundry the Notifying Party explains that “*the primary commercial non-Kubernetes competitor to OpenShift has been [...] (a different open source container platform technology)*”.<sup>420</sup>

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<sup>416</sup> In addition, a respondent expressed the concern that, post-Transaction, IBM would have the incentive to use its influence on “KVM Hypervisor for the Power and Z/LinuxOne architecture” open source projects to delay the release of upstream contributions in order to foreclose competitors. However, the Commission considers that, in any event, post-Transaction, the Merged Entity will not have the ability to exclude rival hypervisors by delaying the release of upstream contributions, or otherwise attempting to frustrate the progress of these extension projects since IBM servers represent only a tiny fraction of the total opportunity for hypervisors. In fact, IBM servers account for less than [0-5]% of new server deployments, and represent only [0-5]% and less than [0-5]% of all servers running on Linux, by revenue and units, respectively (see the Notifying Party’s response to the Commission’s RFI 19, question 5). Accordingly, any deterioration of interoperability with IBM servers would have little to no impact.

<sup>417</sup> A respondent also mentioned a potential concern with respect to the Parties’ role in Open Invention Network (“OIN”), an independent organization created in 2005 in order to ensure a level playing field for Linux by safeguarding developers, distributors, and users from organizations that would leverage patents to hinder its growth and innovation. This respondent however did not provide convincing explanation on how the combination of Red Hat and IBM’s role in OIN could raise competition concerns. In any case, the Commission considers that the Parties will not be able to achieve an increased influence over OIN as a result of the Transaction, since in particular, as explained by the Notifying Party, the bylaws of OIN requires that either IBM or Red Hat transfer their interest in OIN to the other, and the “Continuing Member” will only be entitled to have one vote in total and one seat on OIN’s board. the Notifying Party’s response to the Commission’s RFI 18, questions 3 and 4.

<sup>418</sup> See replies to Questionnaire Q1 to competitors, question 62.

<sup>419</sup> See Form CO, paragraph 572.

<sup>420</sup> See Form CO, paragraph 612.

- (585) The Commission considers that, following the Transaction, the Merged Entity will not have the ability and the incentive to influence the direction of Cloud Foundry in order to reduce the competitive pressure on OpenShift. This is based on the following reasons.
- (586) First, based on the data provided by the Notifying Party, IBM's contributions to the Cloud Foundry project amount to only 5%, far behind Pivotal, which together with its affiliates Dell EMC and VMWare account for almost 70% of contributions.<sup>421</sup> In addition, any attempt by IBM to unduly influence the direction of Cloud Foundry would likely be detected and hampered by a number of companies competing with OpenShift which are involved in the Cloud Foundry project, notably Pivotal but also Dell EMC, Google and Microsoft.
- (587) Second, IBM is only one out of eight organizations with a representative on the Cloud Foundry Board of Directors, which determines the strategic direction and business governance of the project and makes most of its decisions by simple or 70% majority.<sup>422</sup> With one board member, IBM holds only 12.5% of voting rights and has therefore no veto on any kind of decisions. As Red Hat is not currently a member of the Cloud Foundry project, the Transaction would not change this.
- (588) Third, the Notifying Party explains the Transaction will have no impact on IBM's incentives to keep improving Cloud Foundry since IBM will still have a responsibility to support its clients that are currently running their applications on Cloud Foundry through IBM Public Cloud and IBM Cloud Private.<sup>423</sup>

*As regards Microprofile*

- (589) A respondent expressed the concern that, post-Transaction,<sup>424</sup> the Merged Entity would decide to reduce its involvement in the Eclipse Microprofile open source project (i.e., project aimed at developing application programming interface "API" to extend Enterprise Java to microservices architecture) in order to reduce the adoption of products competing with the Merged Entity's middleware (in particular Red Hat's JBoss EAP middleware which is already suitable to a certain extent for the microservice architecture).<sup>425</sup>
- (590) The Eclipse MicroProfile project is a relatively young open source project which was announced in September 2016, with IBM, Red Hat, Tomitribe and Payara as founding members and the London Java Community and SouJava as supporting members.<sup>426</sup> The Eclipse MicroProfile project's founding objective is the vendor-

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<sup>421</sup> <https://cloudfoundry.biterg.io/>

<sup>422</sup> The other directors are appointed, respectively, by Dell EMC, VMware, SUSE, HCL, Swisscom, SAP and Pivotal. See further <https://www.cloudfoundry.org/governance/>. As an exception to the usual "one organization one representative" rule, Dell EMC, VMware, and Pivotal are each represented by one director, due to a special dispensation in the bylaws (Section 3.3 of the Cloud Foundry bylaws provides: "At no time may a Member and its Affiliates have more than one Director who is an employee, officer, director, or consultant of that Member, except that Pivotal, EMC, and VMware, though Affiliates, shall each have one (1) Director on the Board"). The Cloud Foundry bylaws are available at: [https://www.cloudfoundry.org/wp-content/uploads/2017/01/CFF\\_Bylaws.pdf](https://www.cloudfoundry.org/wp-content/uploads/2017/01/CFF_Bylaws.pdf).)

<sup>423</sup> See the Notifying Party's response to the Commission's RFI 19, question 5.

<sup>424</sup> See replies to Questionnaire Q1 to competitors, question 62.

<sup>425</sup> See Form CO, paragraph 327.

<sup>426</sup> Current members include IBM, LJC, Tomitribe, Red Hat, Payara, SouJava, Hazelcast, Fujitsu, KumuluzEE, Hammock, Oracle, Lightbend, and Microsoft. See <https://microprofile.io/>.



neutral advancement and optimization of Java EE for microservices-based architectures, the provision of a platform portable across multiple runtimes and the development of an interoperable microservices architecture that allows communication among polyglot runtimes (not just Java).<sup>427</sup>

- (591) According to the Merged Entity, the Eclipse MicroProfile is currently at the stage of [...].<sup>428</sup> In this respect, the community is currently in the process of actively recruiting participants.
- (592) The Commission considers that, following the Transaction, the Merged Entity will not have the ability and the incentive to impede the development of the Eclipse MicroProfile project in order to reduce the actual and potential competitive pressure on its middleware offering. This is based on the following reasons.
- (593) First, the Eclipse Microprofile project is hosted within the Eclipse Foundation, which serves as a check against behaviour that might seek to concentrate influence over the project in one contributing entity. As also explained above at paragraph (573), IBM and Red Hat currently only have two out of 15 representatives on the Eclipse Foundation Board of Directors,<sup>429</sup> which determines the strategic direction and business governance of the project and makes most of its decisions by simple or two-thirds majority. Following the Transaction, the Merged Entity will have to relinquish one Board seat, so the Merged Entity with only one board member would only hold 7% of voting rights. Given the foundation's governance structure, the Merged Entity will not be able to unduly influence the general direction of the project.
- (594) Second, the Eclipse Foundation did not express any specific concerns with respect to the impact of the Transaction on the development of the Eclipse Microprofile project.<sup>430</sup>
- (595) Third, while IBM and Red Hat account for a large share of current contributions to the Eclipse MicroProfile project (around 75% with IBM representing a 23% contribution share increment<sup>431</sup>), the Notifying Party reports that the Parties' contribution shares are decreasing as the project has recently grown to include a larger number of industry sponsors and contributors.<sup>432433</sup> In addition, recent data

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<sup>427</sup> See <https://projects.eclipse.org/proposals/eclipse-microprofile>.

<sup>428</sup> See Form CO, Annex Pre-Notification RFI 10 – 1.

<sup>429</sup> The other representative on the Board of Directors are: one representative each for CA Technologies, Bosch, CEA List, OBEO, Fujitsu, SAP and Oracle (as Strategic Developer Members), three elected representatives for the two classes of Enterprise and Solution Members, and three elected members of the Committee Members collectively. See further <https://www.eclipse.org/org/foundation/directors.php>.

<sup>430</sup> See Eclipse Foundation's reply to Questionnaire Q3 to competitors, question 5.

<sup>431</sup> See <https://projects.eclipse.org/projects/technology.microprofile/who>.

<sup>432</sup> See the Notifying Party's response to the Commission's RFI 19, Question 5.

<sup>433</sup> Corporate sponsors and members of the project other than IBM and Red Hat include enterprises and foundations like Payara, Tomitribe, Lightbend, LJC, SouJava, Hazelcast, Fujitsu, KumuluzEE, Hammock, Microsoft, and Oracle (see <https://microprofile.io/>). Third party-affiliated and independent developers include developers from the corporate sponsors and other corporations, including e.g. Phoenix Contact, Creative Arts & Technologies, DSoft, Apinauten, and Deutsche Telekom (see <https://microprofile.io/contributors/>).

shows that the adoption of the project among Java EE developers has been rising significantly in the last year.<sup>434</sup> Even if IBM and Red Hat slowed down or reduced their contributions, the Commission therefore considers that this would likely only have a relatively short term impact on the development of the project as other contributors would be able to increase their contributions and assume leadership positions.

- (596) Fourth, the Notifying Party claims that it will have no incentive to reduce contributions in order to advantage the Merged Entity's offering of middleware since, in particular, this project remains key to maintaining the relevance of IBM's middleware products in the new cloud-native microservices environment. In this respect, as set out above at paragraph (241), IBM's Java EE middleware still currently constitute a significant stream of revenues.<sup>435</sup>
- (597) Fifth, even if the Merged Entity were to reduce its contributions in the Eclipse MicroProfile project in a way that would make it more difficult for competing Java EE middleware to be competitive in new microservices environment, there are already a large number of middleware offerings other than the ones offered by Red Hat and IBM that are suitable for microservices environment.<sup>436</sup> This market segment would therefore in any case remain competitive.

*As regards Systemd*

- (598) A respondent expressed the concern that, post-Transaction, the Merged Entity would have the incentive to leverage Red Hat's ability to steer the direction of the "systemd" open source project in order to prevent the development and/or the extension of alternatives to RHEL.<sup>437</sup>
- (599) Systemd is an open source project that provides basic building blocks for a Linux operating system.<sup>438</sup> It is one of the many components of a Linux operating system. Systemd was initially cofounded by a Red Hat engineer and was introduced by Red Hat five years ago as part of RHEL 7. Systemd was originally developed to create an alternative to Canonical's Upstart init system project that developers considered superior from a technical and governance perspective. Systemd has today been adopted more widely by the majority of Linux distributions and it is considered in the industry as a "*de facto standard*".
- (600) The Commission considers that the Transaction will not have any effect on Red Hat's current ability to use its influence on the systemd project in order to reduce

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<sup>434</sup> A 2019 survey indicates that Eclipse Microprofile's reported usage among Java EE developers grew from 13% in 2018 to 28% in 2019, and Eclipse MicroProfile is listed as one of the top three frameworks for building cloud native applications and top cloud native technologies, alongside Spring/Springboot and Kubernetes (See <https://eclipse-foundation.blog/2019/05/10/results-2019-jakarta-ee-developer-survey/> and <https://jakarta.ee/documents/insights/2019-jakarta-ee-developer-survey.pdf>).

<sup>435</sup> See the Notifying Party's response to the Commission's RFI 19, question 5.

<sup>436</sup> These offerings include e.g. Apache Tomcat, Glassfish, Wildfly, Jetty, Pivotal tc Server, Tomtribe, Mulesoft Tcat Server, etc.

<sup>437</sup> See replies to Questionnaire Q1 to competitors, question 62.

<sup>438</sup> See the Notifying Party's response to the Commission's RFI 19, question 5; replies to Questionnaire Q1 to competitors, question 62 and replies to Questionnaire Q3 to open source foundations, questions 1 and 5.

the competitive pressure exercised by alternative Linux distributions on RHEL. This is because, while the Commission’s market investigation confirms that Red Hat currently exercises a significant influence on the direction of systemd, based on the data provided by the Notifying Party, IBM today appears to be a very minor contributor to systemd. In fact, out of a total of 40,409 contributions on “github”, only 58 are associated with an “ibm.com” email address, which represents a contribution of less than 2%.<sup>439</sup>

- (601) In addition, the Commission considers that it is unlikely that the Merged Entity will have the ability and the incentive to use its influence on the systemd project in order to foreclose RHEL’s competitors. In this respect, the reasons set out at paragraphs (527) to (559) with respect to the potential foreclosure of RHEL’s clones through withholding, delaying or degrading access to RHEL’s source code apply *mutatis mutandis*.
- (602) With respect specifically to a foreclosure strategy based on Red Hat’s influence over systemd, while systemd has recently emerged as a de facto industry standard, it is only one type of “init” system for Linux and RHEL’s competitors could therefore migrate to other alternative existing open source init systems such as Upstart or System V and contribute to the further development of these alternative projects.<sup>440</sup> In any case, the Merged Entity’s competitors on the paid Linux-based server operating systems could react by forking the source code of systemd and creating a new community open source project having similar functionalities. Indeed, systemd is one of more than 10,000 RHEL components and, while it is an important and increasingly complex component, it is likely that the sophisticated players active on the paid Linux server operating systems market (e.g., Oracle, SUSE, or Canonical) could team up to develop a fork of systemd. In this respect, the Notifying Party explains that approximately half of the top 10 systemd contributors do not work for Red Hat. With respect to systemd’s top contributors who are employed by Red Hat, the Merged Entity explains that “*they could conceivably leave Red Hat (or IBM) to work on system for another vendor using system technology*”.<sup>441</sup>

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<sup>439</sup> The analysis is based on contributors’ email addresses associated with git commit records to the master branch of the project, as disclosed on <https://github.com/systemd/systemd>. For purposes of this analysis, a “contribution” is considered to be equivalent to one commit record in the git source code version control system that is merged in the master branch of the project. See Notifying Party’s reply to RFI 19, Question 5.

<sup>440</sup> See the Notifying Party’s response to the Commission’s RFI 19, question 5.

<sup>441</sup> See the Notifying Party’s response to the Commission’s RFI 19, Question 5.

**6. CONCLUSION**

(603) 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*