

# The Future of the DBMS Market Is Cloud

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Database management system deployments and innovations are increasingly cloud-first or cloud-only. Data and analytics leaders selecting DBMS solutions must accept that cloud DBMS is the future and must plan for shifting spending, staffing and development accordingly.

## Overview

### Key Findings

- Cloud service providers (CSPs) are becoming the new default platform for database management. These platforms consist of both native CSP offerings and third-party independent software vendor (ISV) offerings that run on CSP infrastructure.
- According to Gartner, on-premises DBMS revenue is decreasing and most DBMS revenue growth is in the cloud (68%). On-premises growth (32%) is rarely from new on-premises deployments; it is generally due to price increases and forced upgrades undertaken to avoid risk.
- Gartner's 2018 DBMS revenue numbers show the overall DBMS market growth at 13% and 18.4%, respectively, in the past two years. AWS and Microsoft represent 72% and 75% of total market growth during this period, respectively.
- As new applications move to the cloud, data and analytics capabilities follow. Contemporary business initiatives, such as digital business transformation, require greater diversity of data and analytics capabilities, causing organizations to look to the cloud for flexibility and agility.

## Recommendations

Data and analytics leaders involved in data management solution decisions should:

- Create a data management strategy that leads with cloud DBMS services, including a multicloud strategy where appropriate. This strategy can include private cloud and/or cloud hosting as a first step to full cloud services for existing applications.
- Plan to migrate on-premises DBMS installations into suitable cloud offerings. This will include an assessment of DBMS migration cost and effort, analysis of appropriate DBMS type, as well as identification of surrounding applications that are likely to move as a cohesive unit.

- Evaluate remaining on-premises systems for sunseting, replacement with SaaS, or migration to private cloud – where they can be managed similar to the public cloud.
- Review current budget processes and adapt them to operational expense models. Include budget items for new skills training, sufficient testing in the cloud (including multicloud) and the overlap of on-premises costs with new cloud costs.

## Strategic Planning Assumptions

By 2022, 75% of all databases will be deployed or migrated to a cloud platform, with only 5% ever considered for repatriation to on-premises.

By 2023, cloud preference for data management will reduce the vendor landscape while the growth in multicloud increases the complexity for data governance and integration.

## Analysis

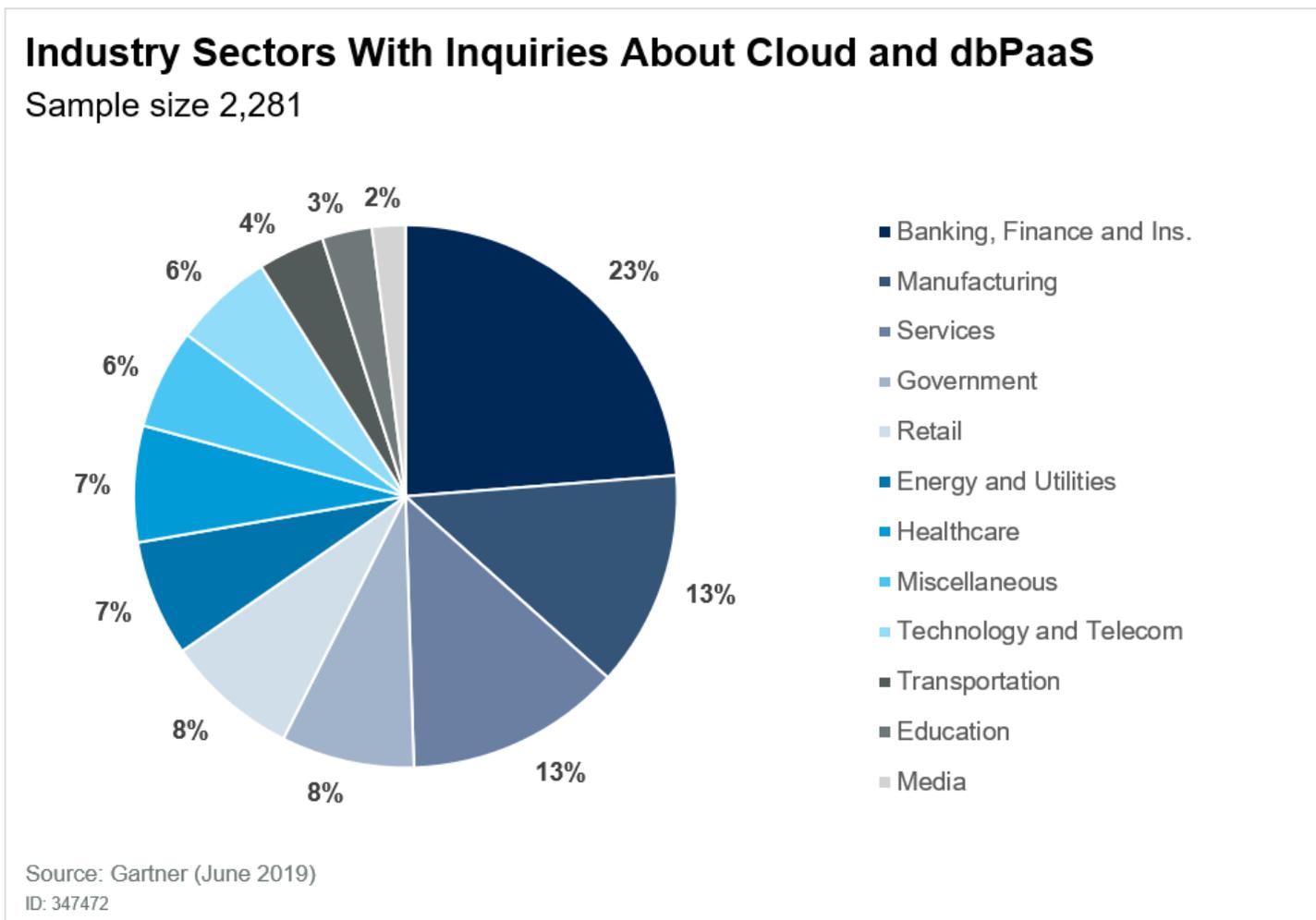
### The Future of the DBMS Market

The future of the DBMS market is cloud – according to Gartner client interactions,<sup>1</sup> and the availability of cloud DBMS services, the interest in and movement to the cloud are increasing fast. In addition, as described below in the section Increasing Relevance of the Cloud and Cloud-Only DBMS Vendors, DBMS revenue growth is primarily in the cloud.<sup>2</sup> The rate of movement to the cloud will differ by organization size; small and midsize organizations will move more quickly to the cloud, while large organizations will transition more slowly over many years. DBMS vendors are innovating in a cloud-only or a cloud-first basis, and moving packaging and support models to an assumed cloud future. Certainly, some of this innovation will be made available on-premises, albeit at a decreasing rate, and its delivery will lag behind cloud delivery. Also, initially there will be an increasing use of private cloud implementations – where cloud DBMS services are made available on-premises in a fully managed environment by the cloud provider. However, we expect this to be transitional in the long run.

Gartner's inquiry service also shows a growing interest in cloud as a deployment platform.<sup>1</sup> Of the more than 8,500 inquiries to Gartner's data management groups since January 2017, 2,200 had something to do with cloud and cloud database platform as a service (dbPaaS). A majority of these inquiries were specifically about data lakes and data warehousing. This trend is explained by the large number of our clients looking to start with this data in the cloud, before moving to projects for the migration of operational systems. Today, the majority of our inquiries are based on cloud services, or discuss some aspect of this. An increasing number of inquiries involve considering some form of private cloud as a steppingstone to the move to public cloud. The industry sectors with the most inquiries with respect to cloud data management are banking and finance, followed by manufacturing, services, government and retail (see Figure 1). This finding refutes the notion that

cloud adoption and interest are limited to nonregulated industries; rather, the interest and adoption includes both highly regulated and nonregulated industries.

**Figure 1. Industry Sectors With Inquiries About Cloud and dbPaaS**



We do not consider cloud hosting infrastructure as a service (IaaS) to be managed cloud services. We do believe, however, that many of the current on-premises licenses will be moved to the cloud using a bring your own license (BYOL) model or credits in the cloud for the monies paid for on-premises maintenance and support. This will continue to be reported by vendors as on-premises revenue, although the systems using these licenses are actually residing in the cloud. This misreporting will continue to inaccurately inflate reported on-premises revenue over a longer period of time. Many clients we speak with are using cloud hosting as a step toward the eventual use of cloud DBMS services – first hosting in the cloud, followed by conversion or migration of the systems to true cloud DBMS services. One advantage of this model is to allow the customer to take advantage of some of the innovations and new features in the cloud DBMS services not propagated to the on-premises DBMS software.

**What Does This Mean for You?**

You must move to the cloud faster to remain competitive, grow revenue and adopt to your changing markets. Cloud DBMS platforms offer:

- **Innovation** – New vendor DBMS development is cloud-only or cloud-first
- **Choice** – A wider variety of DBMS products is adding greater flexibility in best-fit engineering
- **Cost-effective deployment** – Greater flexibility and more rapid configuration for infrastructure
- **Consumption-based spending** – A pay-as-you-go model eliminates the need for capital expenditure (capex) to overprovision, and operating expenditure (opex) to operate, unneeded resources

According to Gartner inquiries, <sup>1</sup> organizations are developing and deploying new applications in the cloud and moving existing assets at an increasing rate, and we believe this will continue to increase. We also believe this begins with systems for the data management solutions for analytics (DMSA) use cases – such as data warehousing, data lakes and other use cases where data is used for analytics, artificial intelligence and machine learning. Increasingly, operational systems are moving to the cloud also, especially with conversion to the SaaS application model. By 2022, 75% of all databases will be deployed or migrated to a cloud platform, with only 5% ever considered for repatriation to on-premises. This trend will largely be due to databases used for analytics, and the SaaS model.

Our research is already heavily weighted toward examining this trend. During the next 12 to 18 months, we will move even more toward research that discusses only cloud DBMS trends and strategies, and the cloud-only and cloud-first vendors and products.

### **Additional Recommendations**

Data and analytics leaders involved in data management solution decisions should:

- Consider on-premises databases as legacy/system of record; optimize/reduce resource allocation and migrate to the cloud when there are incremental benefits justifying the migration costs.
- Move development and testing to the cloud wherever possible, for both the cost savings and the experience it will provide in using the cloud environment and tools.
- Review cloud pricing and financial governance controls to ensure predictable spend as part of your cloud transition, with careful modeling and monitoring of spending on all cloud DBMS services.
- Avoid project delays and issues by preparing for the new cloud challenges of integration across multiple cloud dbPaaS services and hybrid cloud/on-premises deployment.
- Prioritize workloads that are not subject to regulatory restrictions for initial cloud implementations.

- Begin cloud migration projects with an in-depth assessment of the governance implications, with a goal of understanding how and if processes and responsibilities need to change in a public cloud environment.

## Increasing Relevance of the Cloud and Cloud-Only DBMS Vendors

Gartner estimates for 2018 DBMS revenue grew 18.4% to \$46 billion. <sup>2</sup> Cloud DBMS revenue accounts for 68% of the 18.4% growth – and Microsoft and Amazon Web Services (AWS) account for 75.5% of the total growth (we believe Microsoft’s growth is mostly from cloud services). It is important to recognize that four of the top five vendors in revenue order (Oracle, Microsoft, AWS and IBM) are also cloud service providers, with their primary focus on building cloud revenue. Most of the 32% on-premises growth is largely from price increases and perceived lock-in, or “DBMS Stockholm Syndrome” (see Note 1). We believe that most of today’s on-premises DBMS revenue – the majority of which is from maintenance and support of perpetual licenses – will be around for many years.

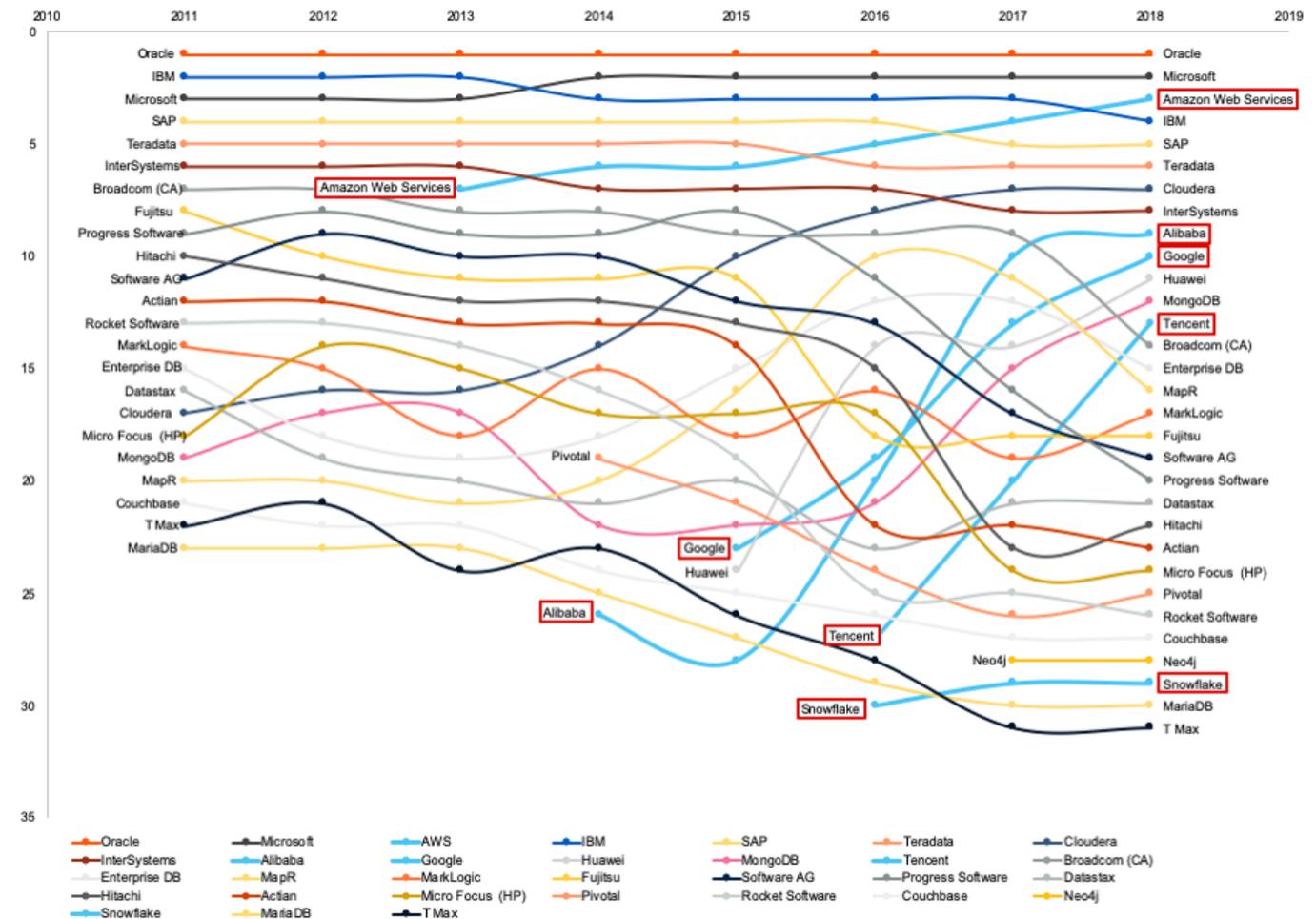
Since 2013, when we began tracking revenue numbers for AWS, we have added four additional cloud-only vendors to Gartner’s market share data: <sup>2</sup> Alibaba, Google, Snowflake and Tencent. In 2018, of the top 15 vendors by revenue, four (Alibaba, AWS, Google and Tencent) are cloud-only. More interesting, however, is the rate at which these cloud-only vendors have gained prominence. In 2014 through 2016, when Alibaba, Google, Snowflake and Tencent were added to the market data, they were near the bottom in terms of revenue rank. In 2018, four out of five of those vendors are in the top half by revenue rank (see Figure 2).

Of even greater relevance, changes in market position have been rare among the top five vendors in this decade. But since 2015, AWS has moved above industry leaders IBM, SAP and Teradata – growing from \$817 million in 2015 to more than \$6 billion in revenue in 2018. <sup>2</sup>

### Figure 2. Gartner Market Share Ranking, 2011-2018

# Gartner Market Share Ranking, 2011-2018

Rank



Source: Gartner (June 2019)

Note: The following historical vendor revenues were combined to reflect the state of the market in 2019: Cloudera, reflecting the merger with Hortonworks; Micro Focus, reflecting the acquisition of HPE Vertica; Broadcom, reflecting the acquisition of CA.  
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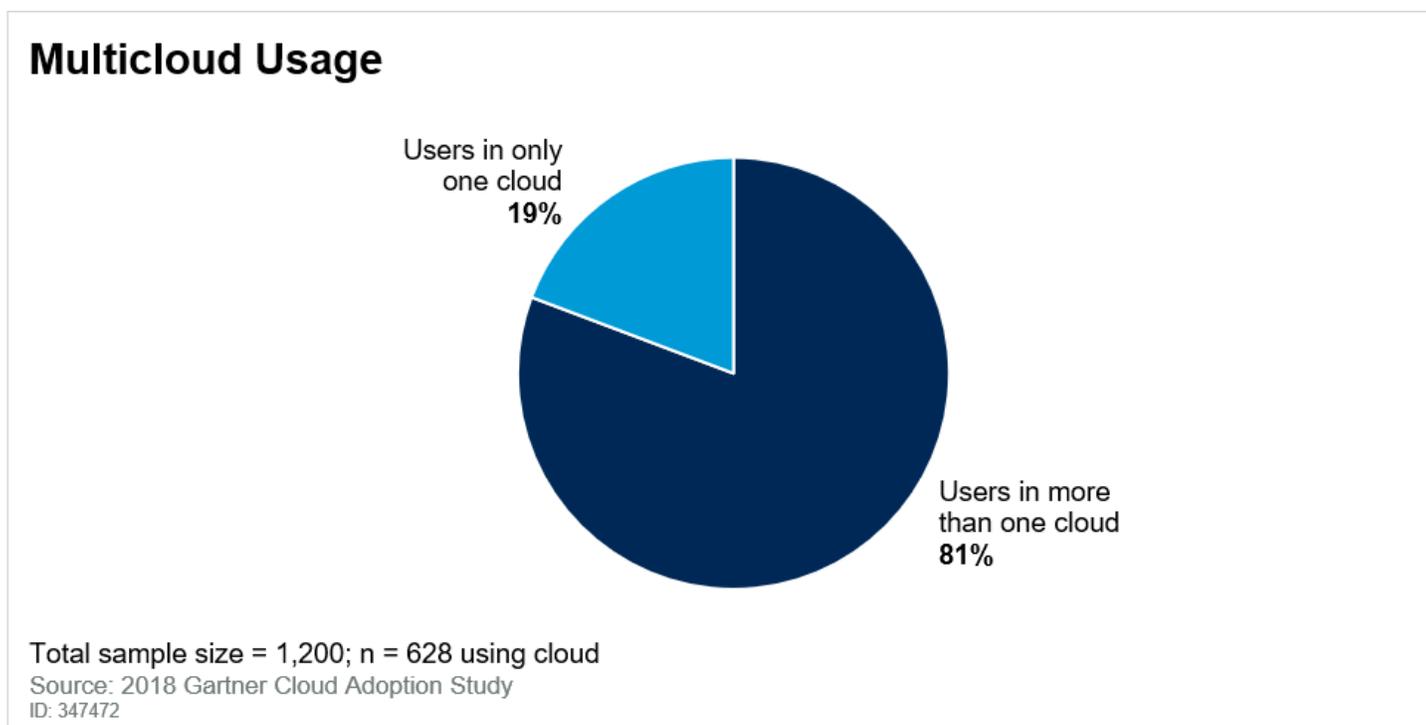
Moreover, the cloud service provider (CSP) infrastructures and the services that run on them are becoming the new data management platform. These platforms consist of:

- General infrastructure that supports IaaS initiatives.
- Common service layers like a cloud object store, that can be used as a data management fabric spanning cloud services.
- Multiple native CSP DBMS point solutions designed to support specific needs through a best-fit engineering approach.
- Third-party independent software vendor (ISV) point solutions that run on cloud infrastructure, typically on multiple CSPs.

Simply put, there is a breadth of services available in every significant CSP. Ecosystems are forming around them that both integrate services within a single CSP and provide early steps toward intercloud data management (see “Are You Ready for Multicloud and Intercloud Data Management?”). This is in distinct contrast to the on-premises approach, where individual products often serve multiple roles but rarely offer their own built-in capabilities to support integration with adjacent products within the on-premises deployment environment.

Regardless of the approach, the prominence of the CSP infrastructure, its native offerings, and the third-party offerings that run on them is assured. A recent Gartner cloud adoption survey showed that of those on the public cloud, 81% were using more than one cloud service provider (see Figure 3).<sup>3</sup> The cloud ecosystem is expanding beyond the scope of a single CSP – to multiple CSPs – for most cloud consumers.

**Figure 3. Multicloud Usage**



What is truly remarkable in 2017 and 2018 is how the Gartner rankings of estimated DBMS cloud services revenue (see Table 1) differ from the overall revenue totals. Four of the top 10 are cloud-only vendors: AWS, Alibaba, Google and Tencent, in that order. Also, total cloud revenue in 2018 was \$10.5 billion or 22.75% of the total DBMS revenue, with 86.71% growth in 2018 over 2017. SAP, the lone non-CSP in the top five vendors by total DBMS revenue, is ranked No. 12 after Snowflake (not shown) and is planning a major focus in marketing and sales to drive strong cloud growth. Also, two of the top 10 vendors in the cloud numbers demonstrate the ability of the non-CSP vendors to compete in the cloud DBMS market.

**Table 1: DBMS Cloud Services Revenue (2016-2018)**

|   | Revenue         |                 |                  | Revenue Growth |               |
|---|-----------------|-----------------|------------------|----------------|---------------|
| ↓   | 2016 ↓          | 2017 ↓          | 2018 ↓           | 2017 ↓         | 2018 ↓        |
| Amazon  | 1,700.64        | 3,615.90        | 6,319.11         | 112.62%        | 74.76%        |
| Microsoft   | 53.38           | 918.27          | 2,149.40         | 1620.11%       | 134.07%       |
| Alibaba   | 96.93           | 213.44          | 460.55           | 120.21%        | 115.77%       |
| Oracle  | 100.16          | 224.76          | 373.12           | 124.40%        | 66.01%        |
| Google  | 101.47          | 164.36          | 285.49           | 61.98%         | 73.70%        |
| Tencent   | 21.87           | 110.85          | 247.30           | 406.96%        | 123.09%       |
| Huawei  | 77.42           | 70.99           | 137.87           | -8.32%         | 94.22%        |
| IBM   | 57.28           | 73.35           | 120.22           | 28.06%         | 63.90%        |
| Cloudera  | 23.85           | 45.35           | 79.21            | 90.15%         | 74.66%        |
| MongoDB   | 9.12            | 8.77            | 65.70            | -3.90%         | 649.33%       |
| Other   | 127.07          | 171.69          | 250.74           |                |               |
| <b>Grand Total</b>  | <b>2,369.19</b> | <b>5,617.73</b> | <b>10,488.70</b> | <b>137.12%</b> | <b>86.71%</b> |
| <i>% of Total DBMS</i>  | <i>6.87%</i>    | <i>14.43%</i>   | <i>22.75%</i>    |                |               |
| Data sourced from <a href="#">“Market Share: Enterprise Platform as a Service, Worldwide, 2018”</a> |                 |                 |                  |                |               |

Source: Gartner (June 2019)

The traditional DBMS vendors that began on-premises continue to have substantial numbers of customers and a revenue stream dominated by maintenance and support on their existing installations – sufficient to plan for and execute a product transition strategy to the cloud. They have

moved at varying rates to make this transition, and now, although all the leading vendors can run on the major cloud platforms, they find themselves competing with aggressive competitors. These competitors have multiple specialized offerings in their portfolios, both relational and nonrelational, often designed to be highly compatible to ease migration using tools provided by the CSPs. The presence of open-source-based and often API-compatible alternatives from the CSPs and others is changing the opportunities for data and analytics leaders to fine-tune their own portfolios.

### On-Premises-Specific Hardware

A final point worth mentioning about the on-premises DBMS market is the continued use of appliances – in the form of preconfigured hardware systems. There are many examples of this from IBM and Teradata, and newer systems such as SAP HANA and Yellowbrick. As we state in [“IT Market Clock for Database Management Systems, 2019,”](#) the future of these is limited and appliances, in general, have moved to the replacement phase of the Market Clock. The cloud infrastructure, especially managed services and platform as a service (PaaS), reduces the need for appliances, because the hardware is and should be transparent to the users. We also believe this extends to the mainframe market. This family of products, dating back to the 1950s, has remained viable due to its level of reliability and availability. Until the cloud became a choice for mission-critical systems, no other hardware platform had demonstrated such high levels of reliability. Today, with a properly configured cloud infrastructure, users can achieve the same levels of reliability and availability as the mainframe, with the same high levels of performance. It should be noted that we are not including Oracle Exadata in the obsolescence of appliances story, because it is the infrastructure used by Oracle in its new Gen 2 Cloud data centers.

## Acronym Key and Glossary Terms

|        |                                |
|--------|--------------------------------|
| AWS    | Amazon Web Services            |
| DBMS   | database management system     |
| dbPaaS | database platform as a service |
| CSP    | cloud service provider         |
| IaaS   | infrastructure as a service    |

## Evidence

<sup>1</sup>**Gartner Inquiry Service.** Since 2Q17, Gartner’s data management analysts have taken more than 8,500 inquiries, not including vendors and investment firms. 2,281 of these inquiries have been about the cloud and dbPaaS, and 361 cloud inquiries were in 1Q19 alone.

<sup>2</sup>["Market Share: All Software Markets, Worldwide, 2018."](#)

<sup>3</sup>**Gartner's Cloud Study 2018 (P-18029 Cloud Adoption).** This survey was conducted online by an external partner, between October and November 2018. The full study surveyed 1,200 individuals, of which 628 respondents reported that their organization was using the public cloud, and 507 reported using more than one public cloud provider. Results of this study do not represent "Global" findings or the market as a whole, but are a simple average of results for the targeted countries covered in this survey.

## Note 1

### DBMS Stockholm Syndrome

Of total worldwide DBMS revenue, 75% continues to be from on-premises implementations – about \$34.5 billion. Most of this is from maintenance and support contracts based on a perpetual license model. Clearly, organizations are beginning to replatform their on-premises databases to the cloud. This is a slow process requiring careful planning of resources and complete testing, especially for mission-critical systems. During this replatforming, on-premises systems continue growing and may require additional licenses. There are situations where systems are no longer on the best technology. But rather than admitting this and changing the technology, organizations opt to continue with what they have in order to avoid risk and unpredictable expense. We call these situations "DBMS Stockholm Syndrome" as they create a captive audience where the only option is to purchase additional DBMS licenses to increase their on-premises deployments. Stockholm Syndrome is often described as a bond formed between captor and captives during forced time together, which is generally considered irrational in light of the danger or risk endured by the victims.

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