White Paper

# Red Hat Enterprise Linux: $1.7 Trillion a Year Boost for Customers

Sponsored by: Red Hat

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## INTRODUCTION

In 2019, IDC published a white paper[1] on the economic footprint of Red Hat Enterprise Linux (RHEL), the costs saving and revenue enhancement advantages using RHEL offered to customers over other versions of Linux, and the size and force of the ecosystem supporting RHEL implementations.

But then the COVID-19 pandemic came online and remains with us.

As IDC has tracked the impact of COVID-19 on information technology (IT) users and vendors, much has changed. The migration to cloud computing accelerated in comparison to on-premises software, organizations were forced to accelerate digital transformation plans to adapt to rapidly changing customer needs, and the migration to remote work does not seem likely to revert to pre-pandemic levels any time soon, if ever.

That opened up a new question: As the IT market and global economy has shifted dramatically, how has that changed the impact and influence of RHEL?

So, with a new survey, updated market tracking forecasts, and updated global economic forecasts, we revisit and update our previous document now. Read on.

## EXECUTIVE SUMMARY

- The overall RHEL footprint – the dollars of revenue or expenses "touched" by the server workloads running on RHEL – will surpass $13 trillion in 2022.
- For customers, the use of RHEL in support of business activities will provide financial benefits to customers of $1.7 trillion in 2022, almost evenly divided between increased revenue and lower costs.
- The RHEL ecosystem will make more than $100 billion this year and will grow to $138 billion in 2026 at a CAGR of 8%. For every dollar of revenue made by Red Hat in 2022, the ecosystem will make $22.60.

[1] For more information, see *The Economic Impact of Red Hat Enterprise Linux: Trillions, Yes Trillions, of Dollars* (IDC #US45007819, May 2019).

- In 2022, Red Hat and its ecosystem will employ more than 990,000 workers, and among customers, the IT professionals who work with the software, hardware, and services stacked on RHEL will number 1.9 million.
- While some firms in the ecosystem are multinationals, most are not. As a result, the ecosystem will invest $57 billion locally in 2022.
- While the pandemic affected organizations worldwide, RHEL customers surveyed reported that as many projects were accelerated as delayed. Of those delayed, most are now completed, underway again, or scheduled to begin, with an average of only 13% of delayed projects being outright cancelled.

## THE STORY OF RHEL

Twenty years ago, Red Hat Enterprise Linux emerged from early open source operating systems (OSs) as the first commercial Linux distribution, coming with a support subscription in addition to the software bits. Now, RHEL is deployed on 9 million physical servers, or 16% of all servers installed. (It also sits on four times as many virtual servers.)

Moreover, RHEL has evolved in tandem with IT buyer demands and dynamics over time and has expanded its capabilities as an operating system to include support for containers. IDC anticipates the market for containers not only to be a high growth area over the next several years but also to be led by commercialized Linux OS types that support them (that, of course, includes RHEL). In fact, in a recent IDC survey,[2] 76% of respondents indicated commercial Linux as their top choice of OS on containers, which accordingly bodes very well for Red Hat as the largest supplier in the commercial Linux segment.

In short, RHEL is the operating system for a significant percentage of enterprise information technology in the world. As such, it touches a significant percentage of the business operations dependent on that technology.

In the microcosm of the RHEL universe, the enterprise level, RHEL touches every department, albeit some more than others.

In the survey deployed to support this white paper,[3] IDC explored the applications running on RHEL servers. For organizations that use RHEL, it is ubiquitous (see Figure 1).

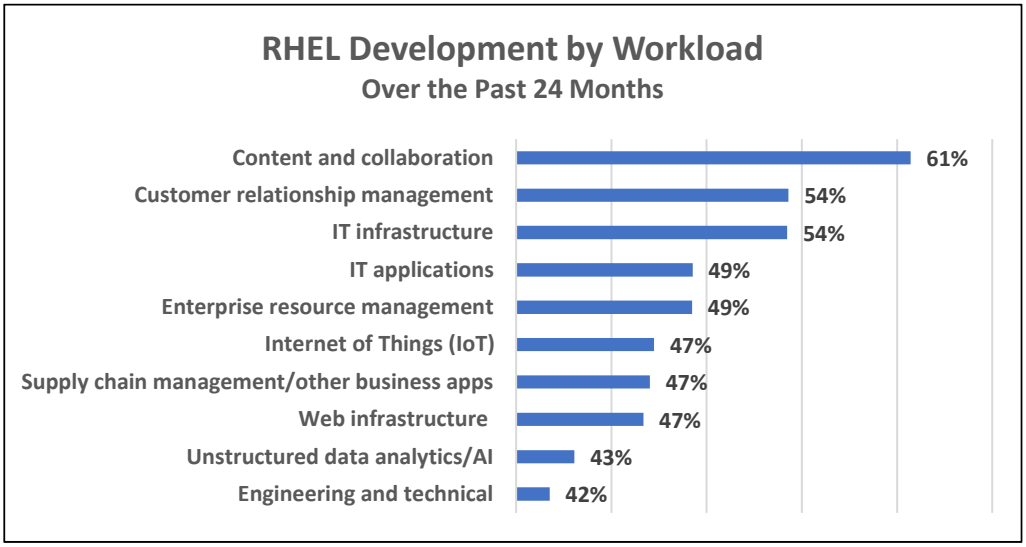
In aggregate, respondent organizations indicated that over the past 24 months, just over 50% of net new enterprise workloads were deployed on RHEL. These workloads affect all major enterprise departments: sales, marketing, operations, finance and administration, customer support, product development, research and, of course, IT.

[2] Source: IDC's *IT Infrastructure for Storage and Data Management Survey,* October 2021

[3] The IDC survey was conducted in fall 2021, with 612 respondents across 6 countries accounting for nearly 80% of servers installed in the world. For more information, see the Appendix: The Survey.

## FIGURE 1

### How RHEL Permeates Organizations




n = 612

Source: IDC survey, October 2021

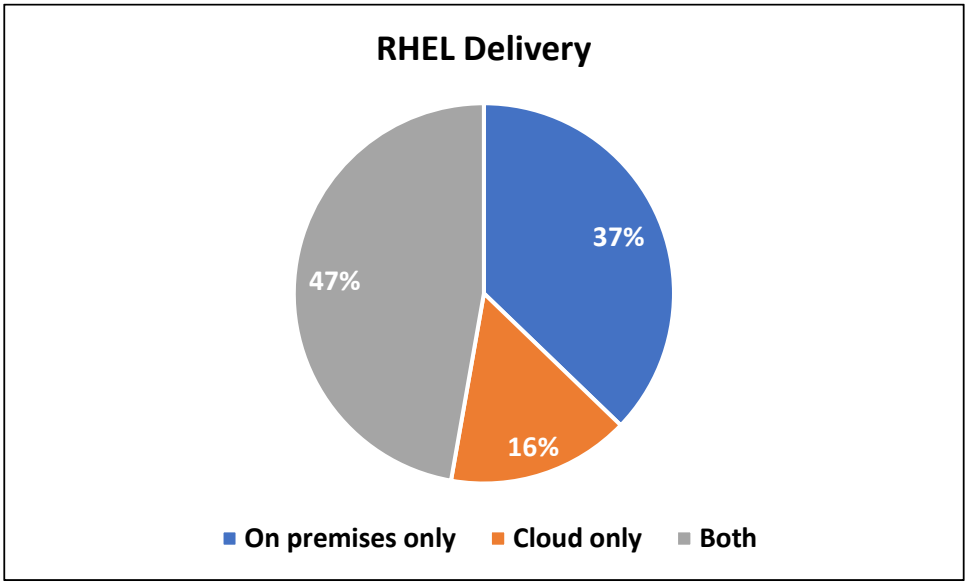
RHEL itself can be deployed either on premises or in the cloud, and, as of 2021, there is no decisive preferred location (see Figure 2).

What's more, RHEL can be deployed in either physical or virtual format (including in the public cloud), with the ratio of virtual instances to physical servers in the vicinity of 8:1.[4]

[4]Data is based on IDC research on the virtualization of Red Hat Enterprise Linux and the survey results shown in Figure 2.

## FIGURE 2

### RHEL's Location Is Flexible




n = 612

Source: IDC survey, October 2021

## THE RHEL FOOTPRINT

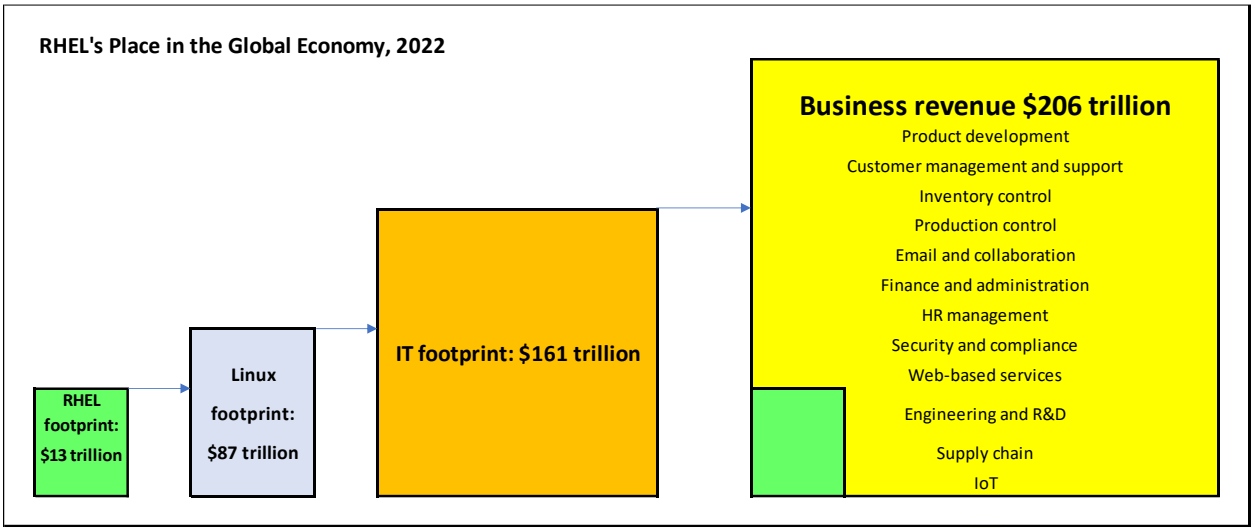
The prevalence of RHEL creates significant ripples in the global economy. After all, RHEL accounts for more than a quarter of all Linux installations, both free and paid; Linux sits on more than half of the 55 million servers installed worldwide; and more than half of all the revenue generated by enterprises worldwide is done so by enterprises with computers.

Figure 3 illustrates RHEL footprint by showing RHEL's place in the IT impact percentage of the economy. It shows how much of that economy is "touched" by computers, Linux, and RHEL.

In this case, "touched" means that the computers, Linux, and RHEL applications and workloads have directly supported enterprise operations and workforce in some way.

## FIGURE 3

### RHEL's $13 Trillion Footprint, 2022




Source: IDC, 2022

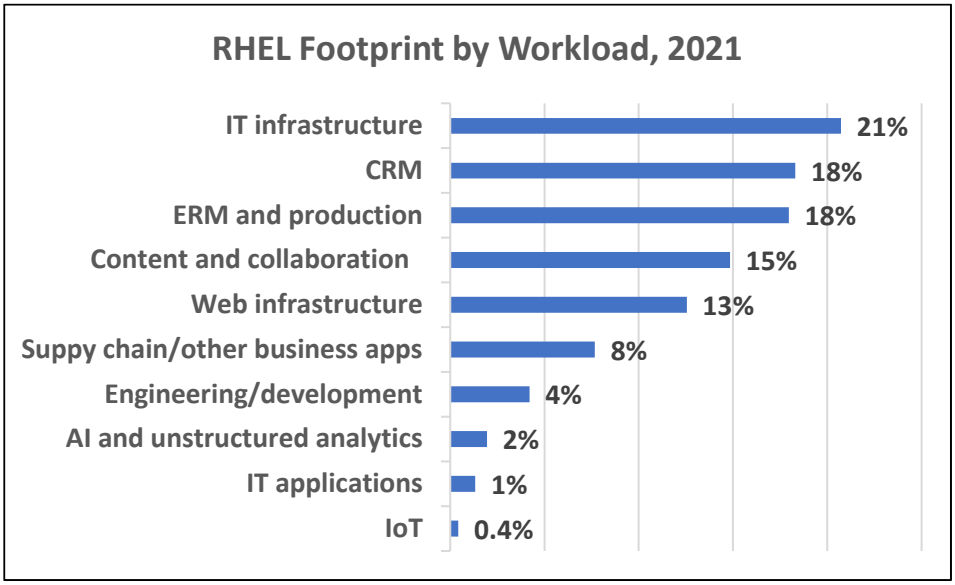
The workloads listed previously in Figure 1 are close to self-explanatory. Customer relationship management can impact the sales force and affect revenue generation from renewals, enterprise resource management can lower the cost of materials and increase operational cycle times, IoT workloads can improve remote monitoring, and so on.

Of course, not all workloads will have an equal footprint. Some are cross-organizational and interface directly with customers, while others affect only a subset of business operations. Using data from the survey conducted for this white paper, data from IDC's Server Workloads Tracker, and data on the impact of IT on organization departments from decades of economic analysis, IDC has been able to break down the RHEL footprint by workload (see Figure 4).

Over time, the RHEL footprint is expected to grow, as RHEL deployments grow and as the global economy itself grows. By 2026, the RHEL footprint should near $17 trillion from today's $13.3 trillion.

## FIGURE 4

### The Makeup of the RHEL Footprint by Workload, 2021




n = 612

Source: IDC survey, October 2021

## THE ECONOMIC PAYOFF OF THAT RHEL FOOTPRINT

Having a large footprint in the economy is one thing; making an impact with that footprint is another. As a vendor or a product, you don't want to just "touch" an operation or a function, you want to improve it in some way.

And that was one of the rationales for conducting a survey for this white paper: to find out how respondents would answer the question of how much deployment of RHEL improved the areas affected by the workloads. IDC asked about specific potential benefits, including:

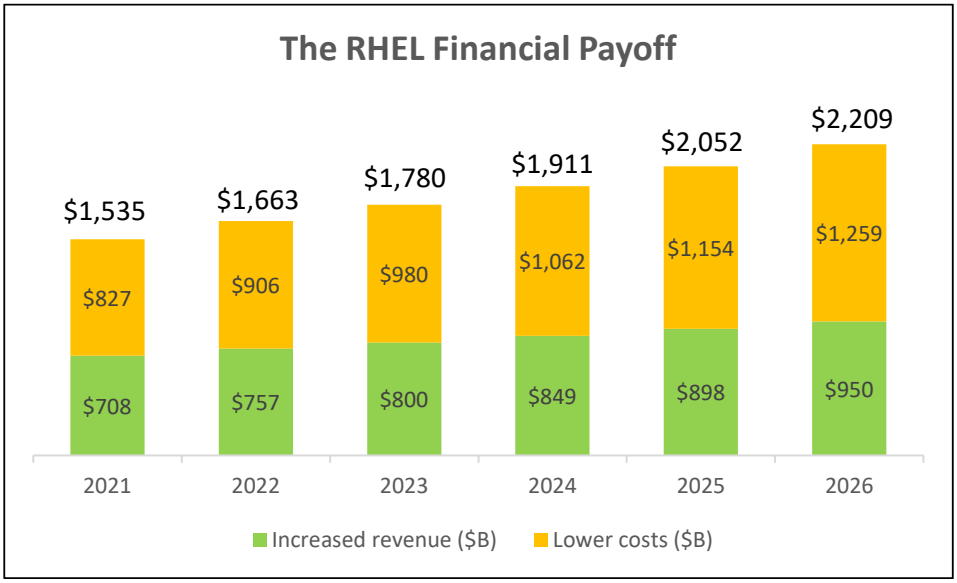
- Increased revenue
- Lower costs
- Improved productivity

IDC then applied those benefits to the forecast workload footprints to get a picture of the benefits of RHEL over time.

Figure 5 shows the aggregate benefits of RHEL deployments across workloads.

## FIGURE 5

### RHEL Saves Money and Makes Money, 2021-2026




Note: For the sake of simplicity, the benefits from improved productivity have been converted to lower costs based on getting more output per labor dollar. This convenience admittedly misses the impact of productivity that speeds revenue generation.

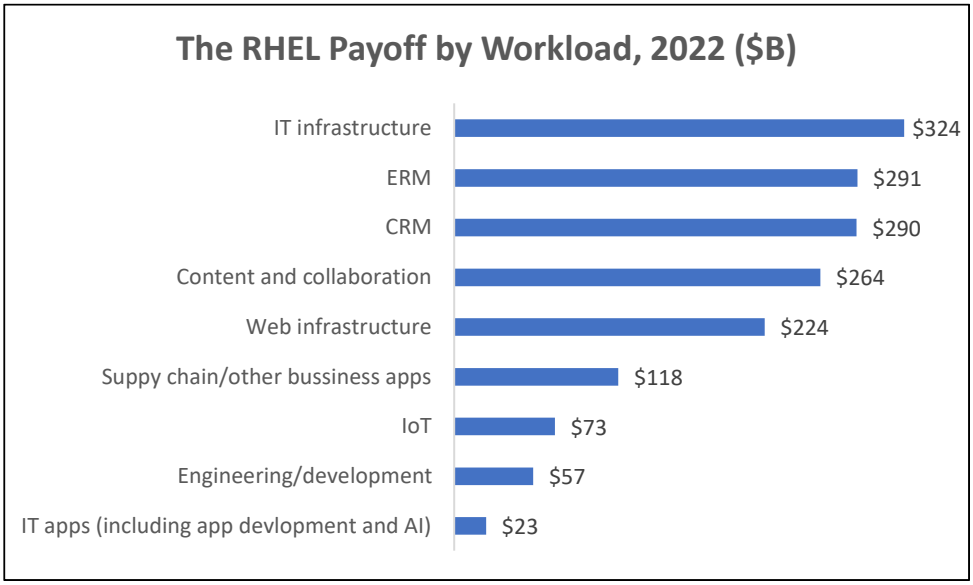
Source: IDC, 2022

By workload, the benefits are weighted to the workloads touching the organization as a whole or large swaths of the customer base, for the most part matching the workload footprints shown previously in Figure 1.

Figure 6 shows the RHEL payoff by workloads.

## FIGURE 6

### The RHEL Payoff by Workload, 2022




Source: IDC, 2022

**Why $1.7 Trillion in Benefits Dwarf the Cost of RHEL?**

At first, it seems strange that IDC could predict benefits in the trillions for the use of product from a vendor that makes less than $10 billion. Even if you lump in ecosystem revenue, that still represents a benefit that's 15 times that spending.

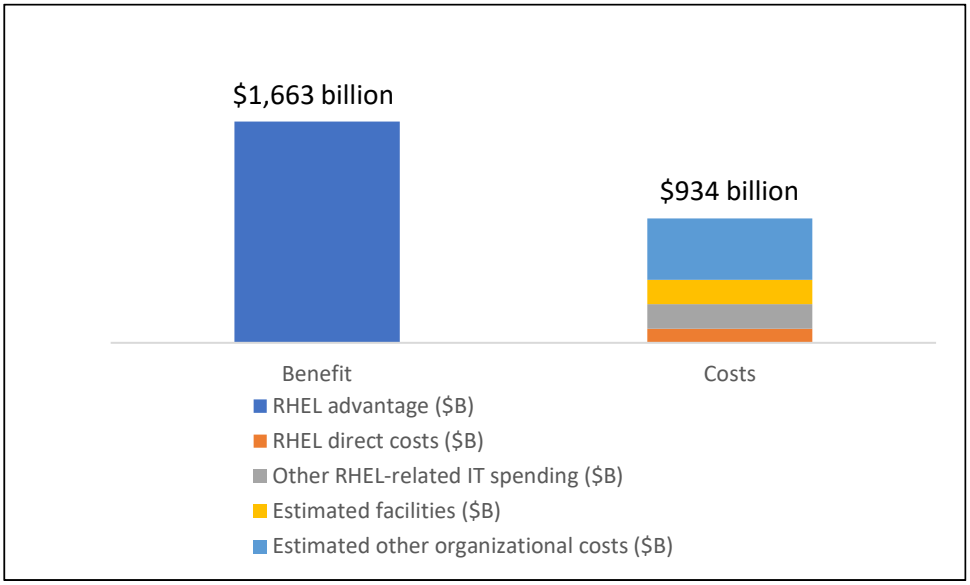
In fact, though, IDC's work sizing the Global Datasphere (i.e., all the petabytes produced or copied in a year) and the true cost of malware transmitted pirated software (More information on 2018 BSA's Global Software Survey is available at **gss.bsa.org/**.) reveals that there is a lot more in implementing technology than just external spending on IT products and services.

There are facilities costs like power and cooling, square footage allocations for computer rooms, some share of internal spending on IT staff, end-user time working on applications (or suffering downtime), and some share of the costs of just running a business. Then also there are the costs of IT downtime (which may be less for RHEL servers, but yet have a cost) and so on.

Figure 7 puts these non-RHEL-specific costs into perspective. The RHEL benefit story is still powerful, but not actually outrageous.

## FIGURE 7

### The Full RHEL Investment Payoff




Source: IDC, 2022

## THE RHEL DELIVERY SYSTEM: A $100 BILLION ECOSYSTEM

By its nature as an operating system, RHEL is a platform that supports all sorts of add-on products and services. In fact, it is designed to do so.

IDC refers to the collection of vendors providing these add-on products and services as an ecosystem, each part of which is connected to others. The companies in this ecosystem are often Red Hat official partners, but not always. They may be brought into implementation by other vendors, consultants, or the enterprise themselves.

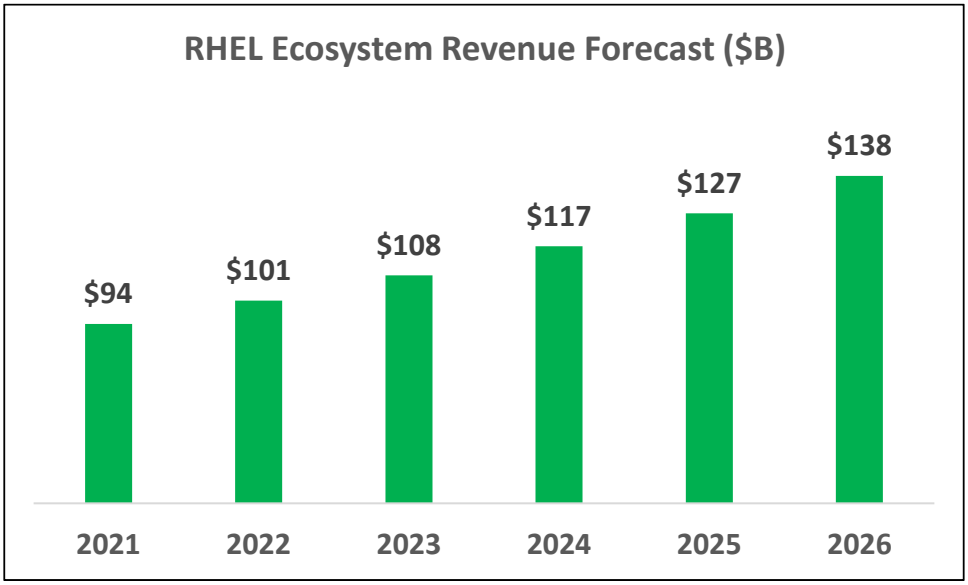
In fact, according to survey respondents, the average implementation required more than seven vendors to complete.

Figure 8 shows both the size and growth expected for the RHEL ecosystem for 2021-2026. In 2022, the ecosystem is expected to surpass $100 billion in revenue, and by 2026, it is expected to be nearly 50% bigger than it was in 2021. Figure 9 shows the breakdown of RHEL ecosystem add-on products and services.[5]

[5] Because many vendors sell others' products, to avoid double-counting revenue, IDC tallies only the gross margin (i.e., revenue minus the cost of the resold products or services) in aggregating ecosystem revenue.

## FIGURE 8

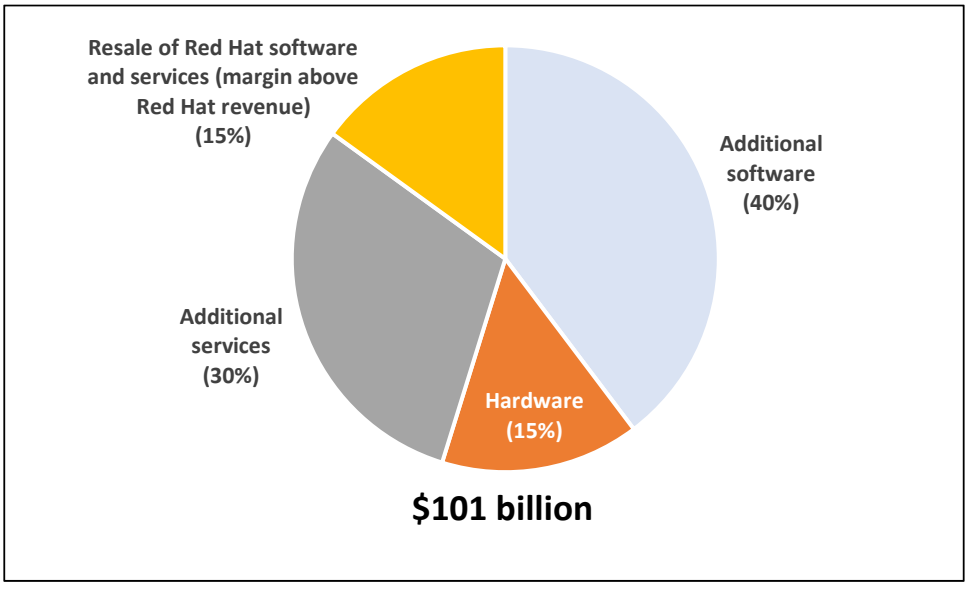
### RHEL Ecosystem Opportunity, 2021-2026




Source: IDC, 2022

## FIGURE 9

### RHEL Ecosystem Revenue by Category, 2022




Source: IDC, 2022

Note that these percentages won't stay the same over time. The share of software will grow as cloud software grows faster than the other markets and, along the way, supplants some services.

Also note that IDC clocks ecosystem revenue at more than 20 times Red Hat's ecosystem revenue in 2021, growing to 25 times in 2026.[6]

The RHEL ecosystem generates economic benefits for RHEL customers as discussed previously, but it also generates other economic benefits. Together, in 2022, Red Hat and its ecosystem will employ more than 990,000 workers and, what's more, provide the livelihood for 1.9 million IT professionals working with RHEL in their respective organizations. By 2026, the combined universe of Red Hat, Red Hat ecosystem, and dedicated RHEL IT professionals in user organizations could encompass 3.4 million people.

In addition, this year, Red Hat and its ecosystem can be expected to invest $57 billion locally in support of local operations. By 2026, that investment could be $25 billion larger. The *indirect* impact of this local investment and employment could triple that number.[7]

## THE RHEL IMPACT BY REGION

The economic impact of RHEL by region is driven mainly by the deployment of Linux by region. And here there is an anomaly centered on EMEA. The region has 15% of all the servers installed worldwide, but only 8% of the servers running Linux (and 27% of the servers running Windows). IDC suspects the reason is Microsoft's long campaign against governmental efforts to encourage enterprises to migrate to open source software.

[6] Readers may notice that IDC publishes ecosystem revenue ratios for other vendors and that, in general, they are considerably lower than Red Hat's ecosystem revenue. This reflects RHEL's function as an operating system, which is *designed* to sit on other vendors' hardware and support other vendor software. Microsoft Windows is analogous to RHEL, but in any ecosystem revenue ratio, Microsoft's own application software and services would move to the denominator of the ratio from the numerator.

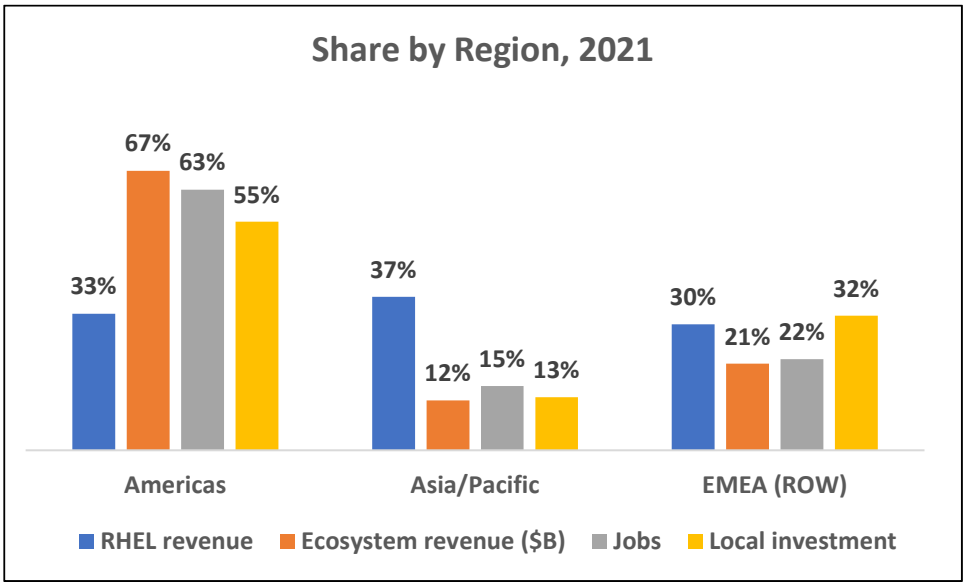
[7] Economists refer to the second-level effects of spending or job created as indirect or induced economic impacts. These can be anywhere from 1 to 4 times as big as the direct impact, depending on the industry generating the direct impact.

Figure 10 shows the regional effects of the RHEL ecosystem.

RHEL does not exist in a vacuum, but as part of a complex web of software, hardware, networks, services, and distribution services that, together, make up the implementations that affect customer organizations and, hence, the larger economy.

## FIGURE 10

### The RHEL Ecosystem Across the Globe, 2021




Source: IDC, 2022

**RHEL Navigates the Pandemic**

As COVID-19 has affected daily lives and the economy, so it has affected the deployment of information technology. IT spending growth in 2020 plummeted, the migration to cloud computing sped up, and the workforce went from less than 10% working remotely in 2019 to greater than 50% by May 2020. (Data is from an IDC survey conducted in the last week of May 2020 of 700 enterprises in 21 countries.) Back then, respondents predicted that after the pandemic, the percentage of remote workers wouldn't fall back below 30%. That prediction appears to have held true.

In the survey conducted for this white paper, IDC asked about the impact of the COVID-19 pandemic on RHEL projects versus non-RHEL projects (see Figure 11). Note that more than half the projects were actually accelerated for RHEL organizations.

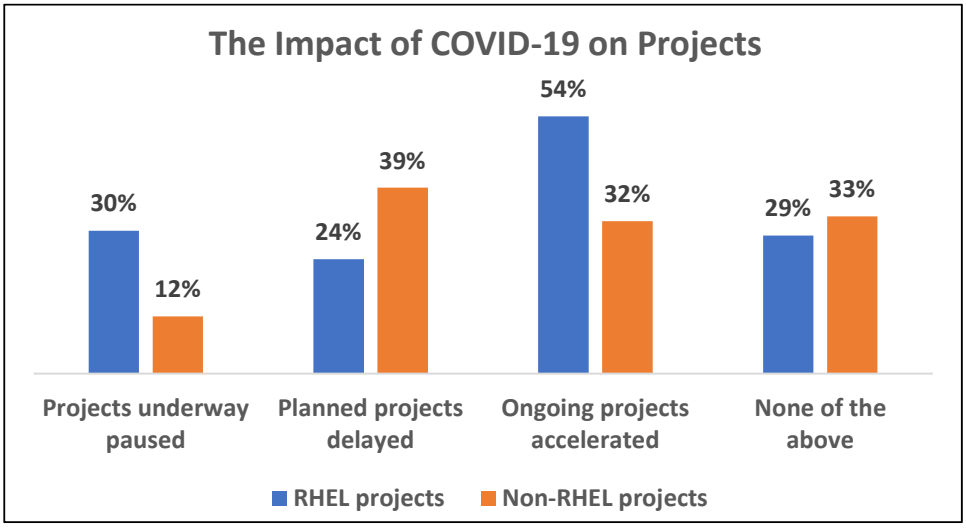
As for projects that were delayed because of COVID-19, those that were deployed on RHEL held a significant advantage compared with those on other operating systems (24% versus 39% of organizations delaying projects, respectively). We also found that among these types of RHEL-based projects that were delayed at the time, an average of roughly 87% of them have been either completed, resumed, or planned to resume in the near future.

There were also other benefits. About a third of respondents agreed with statements that RHEL allowed them to restart projects seamlessly, restart paused projects, and rapidly start delayed projects. 40% of respondents agreed that RHEL contributed to the ability to complete accelerated projects successfully.

The fact that RHEL — and Red Hat, the Red Hat ecosystem, and trained IT professionals — helped customers navigate an event unseen since the advent of computers bodes well for all involved.

## FIGURE 11

### Effects of the Global Pandemic on IT Projects




n = 612

Source: IDC survey, October 2021

## LESSONS IN THE DATA ARE CALLS TO ACTION

The data in the IDC models and the survey are clear:

- The migration to cloud is past its midpoint. In 2021, just over 40% of software sold was delivered over the cloud. IDC forecasts that by 2026, that percentage will be more than 60%. (Of course, there is still a lot more software *installed* on premises than coming via the cloud.)
- The migration to cloud will be accompanied by a wave of operating system virtualization. The ratio of virtualized instances in the cloud compared with on premises is 4:1.
- The changing architectural landscape will put pressure on IT organizations to keep up, as skilled talent is in short supply and the labor force is growing much more slowly than the deployment of next-generation IT.
- Because of the shortage of skilled talent and labor force, end-user organizations will be relying on their vendors for more and more sophisticated levels of support. A healthy and well-supported vendor ecosystem will be critical.
- The increasing penetration of IT into all aspects of an organization's life will increase not just the benefits of deployed IT but the risks of not optimizing deployment. After all, trillions of dollars are at stake.

But perhaps the biggest lesson in the data is what the survey said about how a piece of software aided organizations to contend with sudden uncertainty, as the "RHEL Navigates the Pandemic" sidebar pointed out. If RHEL can demonstrably help customers deal with a global pandemic, surely it can help them deal with the stress and strain of digital transformation, Brownian motion in the workplace, and yet unforeseen uncertainty.

## APPENDIX: DATA TABLES

Table 1 provides RHEL economic impact. Table 2 shows RHEL ecosystem opportunity.

| **Table 1** | | | | | | |
|---|---|---|---|---|---|---|
| **RHEL Economic Impact, 2021–2026** | | | | | | |
| | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
| **Worldwide** | | | | | | |
| **Economic footprint** | | | | | | |
| Enterprise revenue ($B) | $197,845 | $205,993 | $212,195 | $218,161 | $224,122 | $230,260 |
| IT and business app footprint ($B) | $82,715 | $87,815 | $92,283 | $96,837 | $101,592 | $106,634 |
| RHEL economic footprint ($B) | $12,410 | $13,296 | $14,067 | $14,903 | $15,778 | $16,707 |
| **The RHEL advantage** | | | | | | |
| Increased revenue ($B) | $708 | $757 | $800 | $849 | $898 | $950 |
| Lower costs ($B) | $827 | $906 | $980 | $1,062 | $1,154 | $1,259 |
| | $1,535 | $1,663 | $1,780 | $1,911 | $2,052 | $2,209 |
| **Americas** | | | | | | |
| **Economic footprint** | | | | | | |
| Enterprise revenue ($B) | $65,299 | $67,666 | $69,165 | $70,523 | $71,967 | $73,441 |
| IT and business app footprint ($B) | $27,104 | $28,637 | $29,867 | $31,090 | $32,411 | $33,804 |
| RHEL economic footprint ($B) | $4,951 | $5,309 | $5,586 | $5,889 | $6,208 | $6,543 |
| **The RHEL advantage** | | | | | | |
| Increased revenue ($B) | $292 | $312 | $328 | $346 | $364 | $383 |
| Lower costs ($B) | $351 | $380 | $410 | $442 | $478 | $518 |
| | $643 | $692 | $738 | $788 | $842 | $901 |
| **APJ** | | | | | | |
| **Economic footprint** | | | | | | |
| Enterprise revenue ($B) | $72,699 | $75,970 | $79,009 | $82,090 | $85,210 | $88,448 |
| IT and business app footprint ($B) | $29,526 | $31,460 | $33,376 | $35,389 | $37,506 | $39,766 |
| RHEL economic footprint ($B) | $5,122 | $5,524 | $5,929 | $6,369 | $6,820 | $7,304 |
| **The RHEL advantage** | | | | | | |
| Increased revenue ($B) | $297 | $320 | $343 | $369 | $395 | $423 |
| Lower costs ($B) | $356 | $391 | $429 | $472 | $520 | $576 |
| | $653 | $711 | $772 | $841 | $915 | $999 |
| **EMEA** | | | | | | |
| **Economic footprint** | | | | | | |
| Enterprise revenue ($B) | $59,847 | $62,357 | $64,021 | $65,548 | $66,945 | $68,371 |
| IT and business app footprint ($B) | $26,085 | $27,718 | $29,040 | $30,358 | $31,675 | $33,064 |
| RHEL economic footprint ($B) | $2,337 | $2,463 | $2,552 | $2,645 | $2,750 | $2,860 |
| **The RHEL advantage** | 19% | 19% | 18% | 18% | 17% | 17% |
| Increased revenue ($B) | $119 | $125 | $129 | $134 | $139 | $144 |
| Lower costs ($B) | $120 | $135 | $141 | $148 | $156 | $165 |
| | $239 | $260 | $270 | $282 | $295 | $309 |
| | | | | | | |
| **Worldwide RHEL footprint by workload** | | | | | | |
| AI and unstructured analytics | 2% | 2% | 2% | 2% | 3% | 3% |
| Content and collaboration | 15% | 15% | 15% | 15% | 15% | 15% |
| ERM and production | 18% | 18% | 18% | 18% | 17% | 17% |
| CRM | 18% | 18% | 18% | 18% | 18% | 19% |
| Suppy chain/other business apps | 8% | 8% | 8% | 8% | 7% | 7% |
| Engineering/development | 4% | 4% | 4% | 4% | 4% | 4% |
| IT applications (data management, AppDev, structured data analytics) | 1% | 1% | 1% | 1% | 1% | 1% |
| IT infrastructure (including web, VDI, and security) | 21% | 20% | 20% | 19% | 19% | 18% |
| IoT | 0% | 1% | 1% | 1% | 1% | 1% |
| Web infrastructure | 13% | 13% | 13% | 13% | 14% | 14% |
| | 100% | 100% | 100% | 100% | 100% | 100% |
| Source: IDC, 2022 | | | | | | |

| Table 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **RHEL Ecosystem Opportunity, 2021–2026** | | | | | | | |
| | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | Five-Year Net-New Opportunity |
| **Ecosystem Growth Summary ($M)** | | | | | | | |
| **Worldwide** | | | | | | | |
| Additional software | $36,712 | $40,032 | $43,940 | $48,526 | $53,861 | $60,151 | $62,950 |
| Additional hardware | $14,266 | $15,189 | $15,834 | $16,601 | $17,353 | $18,096 | $11,743 |
| Additional services | $28,822 | $30,434 | $32,201 | $34,089 | $36,159 | $38,449 | $27,222 |
| Resale margin of Red Hat software and services | $13,977 | $15,140 | $16,423 | $17,899 | $19,578 | $21,514 | $20,669 |
| Total | $93,777 | $100,795 | $108,398 | $117,115 | $126,951 | $138,210 | $122,584 |
| | | | | | | | |
| Ratio to RHEL revenue | 21.9 | 22.6 | 23.3 | 23.9 | 24.5 | 25.0 | |
| | | | | | | | |
| Industry ecosystem jobs (including Red Hat) | 922,880 | 993,931 | 1,033,982 | 1,078,099 | 1,126,190 | 1,179,215 | 256,334 |
| IT professional jobs | 1,753,135 | 1,895,978 | 1,963,408 | 2,037,192 | 2,117,713 | 2,214,269 | 461,134 |
| Ecosystem local investment (including Red Hat) | $52,986 | $56,899 | $61,205 | $66,114 | $71,671 | $78,045 | $69,002 |
| | | | | | | | |
| **Americas** | | | | | | | |
| Additional software | $25,118 | $27,369 | $30,037 | $33,182 | $36,874 | $41,276 | $43,148 |
| Additional hardware | $8,805 | $9,328 | $9,635 | $10,020 | $10,371 | $10,692 | $6,021 |
| Additional services | $19,671 | $20,816 | $22,089 | $23,450 | $24,943 | $26,598 | $19,541 |
| Resale margin of Red Hat software and services | $9,430 | $10,216 | $11,086 | $12,090 | $13,237 | $14,569 | $14,048 |
| Total | $63,024 | $67,729 | $72,847 | $78,742 | $85,425 | $93,135 | $82,758 |
| | | | | | | | |
| Ratio to RHEL revenue | 21.2 | 21.8 | 22.4 | 22.9 | 23.4 | 23.9 | |
| | | | | | | | |
| Industry ecosystem jobs (including Red Hat) | 614,071 | 660,750 | 688,102 | 718,387 | 751,720 | 788,976 | 174,905 |
| IT professional jobs | 1,062,383 | 1,145,330 | 1,181,401 | 1,221,126 | 1,264,517 | 1,324,494 | 262,111 |
| Ecosystem local investment (including Red Hat) | $29,104 | $31,253 | $33,672 | $36,424 | $39,555 | $43,169 | $38,553 |
| | | | | | | | |
| **APJ** | | | | | | | |
| Additional software | $3,657 | $4,064 | $4,523 | $5,046 | $5,636 | $6,301 | $7,285 |
| Additional hardware | $3,016 | $3,330 | $3,631 | $3,951 | $4,299 | $4,678 | $4,809 |
| Additional services | $2,950 | $3,129 | $3,316 | $3,514 | $3,729 | $3,964 | $2,902 |
| Resale margin of Red Hat software and services | $1,633 | $1,799 | $1,977 | $2,176 | $2,397 | $2,644 | $2,828 |
| Total | $11,256 | $12,322 | $13,447 | $14,687 | $16,061 | $17,587 | $17,824 |
| | | | | | | | |
| Ratio to RHEL revenue | 23.7 | 25.1 | 26.3 | 27.6 | 29.0 | 30.7 | |
| | | | | | | | |
| Industry ecosystem jobs (including Red Hat) | 125,283 | 137,164 | 143,648 | 150,441 | 157,452 | 164,688 | 39,405 |
| IT professional jobs | 288,341 | 321,371 | 342,025 | 364,007 | 387,870 | 407,022 | 118,681 |
| Ecosystem local investment (including Red Hat) | $6,745 | $7,215 | $7,676 | $8,201 | $8,774 | $9,406 | $7,547 |
| **EMEA** | | | | | | | |
| Additional software | $7,937 | $8,599 | $9,380 | $10,298 | $11,351 | $12,574 | $12,517 |
| Additional hardware | $2,445 | $2,531 | $2,568 | $2,630 | $2,683 | $2,726 | $913 |
| Additional services | $6,201 | $6,489 | $6,796 | $7,125 | $7,487 | $7,887 | $4,779 |
| Resale margin of Red Hat software and services | $2,914 | $3,125 | $3,360 | $3,633 | $3,944 | $4,301 | $3,793 |
| Total | $19,497 | $20,744 | $22,104 | $23,686 | $25,465 | $27,488 | $22,002 |
| | | | | | | | |
| Ratio to RHEL revenue | 23.2 | 24.1 | 24.8 | 25.4 | 25.7 | 25.8 | |
| | | | | | | | |
| Industry ecosystem jobs (including Red Hat) | 183,526 | 196,017 | 202,232 | 209,271 | 217,019 | 225,550 | 42,024 |
| IT professional jobs | 402,410 | 429,277 | 439,982 | 452,060 | 465,325 | 482,752 | 80,342 |
| Ecosystem local investment (including Red Hat) | $17,138 | $18,431 | $19,857 | $21,489 | $23,342 | $25,470 | $22,899 |
| Source: IDC, 2022 | | | | | | | |

## APPENDIX: METHODOLOGY

Since 2005, IDC has used its extensive research and forecast base along with surveys to calculate and forecast the impact various vendors have on local economies. There are several variations of these products:

- **Economic impact studies:** Studies showing the economic "footprint" of the vendor ecosystem — how much business revenue is "touched" by the ecosystem's products interacting with various business functions
- **Vendor advantage views:** Studies based mostly on surveys or interviews that demonstrate the comparative advantages of using the vendor's products
- **Vendor ecosystem sizing:** How big, in terms of revenue and/or employment, the ecosystem supporting the vendor's products

This project for Red Hat software entails elements of all three variations, the output of which is shown in the charts and tables in the study.

### The RHEL Footprint and Advantage

The RHEL economic footprint is the quantification of the amount of business revenue and expenses "touched" by the applications and workloads running on RHEL and supported by the RHEL ecosystem, as explained in the paper. Note that "touch" is not a measure of what specific percentage of revenue is directly driven by IT, as in, say, internet commerce or automated customer support, but its reach into organizational activities. It is a simple concept but a somewhat complex calculation.

The economic footprint in this project progresses (refer back to Figure 3). The allocation exercise — RHEL's percentage share of Linux, Linux's share of IT, and revenue of companies using IT as a percentage of all revenue — is enabled by IDC research products that track server installed base by operating system, reports on the vendor market share of Linux (paid and unpaid), and data on business revenue calculated from GDP and gross output figures from government and third-party sources (e.g., the U.S. Bureau of Economic Analysis, the Bureau of Labor Statistics, and the Economist Intelligence Unit).

The allocation of revenue and expenses by department is based on IDC's long history of conducting analysis on the intersection of IT and the economy. The allocation of impact by workload is enabled by this history of economic analysis and IDC's Server Workload Tracker.

For each application/workload, IDC estimates the percentage of enterprises using that application/workload based on survey data and the application/workload's "footprint" — or percentage of revenue/expenses likely affected by such an application/workload. These percentages are then applied to the regional revenue/expenses to get the total application/workload footprint.

From this point, the RHEL footprint is derived by applying the RHEL share of Linux by workload and the Linux share of all enterprise operating systems by workload.

The economic advantage from using RHEL takes workload footprints and survey data that describes the percentage improvement using RHEL by workload.

## The RHEL Ecosystem

IDC routinely sizes vendor ecosystems in discussions of economic impact. To do so here, IDC estimated Red Hat's RHEL revenue based on published research and the forecasts of the software submarkets within which Red Hat operates. IDC then estimated all the ancillary software, hardware, and services tied to RHEL using information from the survey and data comparing multitudinous submarkets with each other. Since vendors buy and sell each other products, IDC also adds resale gross margin to ecosystem opportunity, thus matching total potential add-on revenue to end-user spending.

## APPENDIX: THE SURVEY

In October 2021, IDC conducted an online survey of 612 organizations in China, Germany, Italy, Japan, the United Kingdom, and the United States that had a least 100 employees. These countries account for 80% of the installed base of servers.

The distribution of respondents by industry, job title, and department fit normal parameters for extrapolation to a global total.

Table 3 shows the respondent distribution. 50% of respondents in IT was deliberate to ask technical questions for IT managers to which line managers might not know the answer.

| **Table 3** | | | | |
|---|---|---|---|---|
| **Survey Respondents** | | | | |
| | | | | |
| **Sample by number of employees** | | | **Sample by industry** | |
| 100–499 | 13% | | Finance | 25% |
| 500–999 | 25% | | Manufacturing | 22% |
| 1,000–4,999 | 36% | | Retail/wholesale | 16% |
| 5,000+ | 26% | | Public sector | 13% |
| | 100% | | Infrastructure | 17% |
| | | | Other | 8% |
| | | | | 100% |
| **Sample by department** | | | **Sample by role** | |
| Management | 13% | | President/VP/owner | 19% |
| Finance | 11% | | Director | 49% |
| Operations | 17% | | Other management | 32% |
| Sales/marketing/devlopment/support) | 9% | | | 100% |
| IT | 50% | | | |
| | 100% | | | |
| Source: IDC, 2022 | | | | |

## About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

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