Special Study

# Market Trends in Virtualization Infrastructure and Software, 2016: Market Survey Report

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## IDC OPINION

IDC's survey with 451 current enterprise-scale users of virtualization software and infrastructure finds that most enterprise IT teams are in the mature phases of virtualization deployment. Enterprise decision makers are clearly optimistic about the benefits derived from virtualizing their private and public cloud environment – namely, IT cost reductions related to fewer server purchases and increased staff productivity as well as increased server utilization and business agility. This document summarizes IDC's findings about the current use of virtualization software by a well-distributed sample of virtualization users across five countries and also summarizes both findings and IT departments' planning assumptions for future rollouts. Major findings include:

- Increasing rates of virtualization over the past eight years as well as into the near- and medium-term future
- Cost savings, increased server utilization rates, and business agility as major drivers of virtualization adoption
- Increasing dominance by two players, VMware and Microsoft, across paid, nonpaid, and multiple cloud environments despite the arrival of feature parity on competing, lower-cost platforms

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## IN THIS STUDY

This document is the second of three deliverables that constitute IDC's special study titled *Market Trends in Virtualization Infrastructure and Software, 2016*. This specific document discusses IDC's findings from a market survey of 451 users of virtualization technology. It summarizes the current level of market maturity for virtualization infrastructure and software and identifies a number of important planning assumptions made by IT decision makers as they equip their departments to deploy new workloads in the near- to medium-term future.

### Methodology

IDC conducted a web-based market survey of 451 users of server virtualization technology during the months of August and September 2016. To qualify for inclusion in the survey, respondents had to:

- Work for a company that deploys hypervisors on servers (Virtualization products on laptops did not qualify for inclusion.)
- Work for a company with more than 10 employees
- Be an IT professional who is significantly involved with decision making for both servers and virtualization products at his/her firm

Respondents were based in the United States (205), China (121), India (43), Brazil (41), and Russia (41). United States-based respondents were a plurality of the sample size to highlight the continued importance of the U.S. market for virtualization vendors. In addition, developed regions like Western Europe and Japan have historically shown similar rates of virtualization as well as virtual machine (VM) densities and were thus excluded from the sample size. The respondents in the BRIC countries were chosen to highlight the growing importance of those countries in the virtualization market as well as to capture insights into the differences that those markets inevitably possess.

The survey did not place any restriction on vertical and placed only a small restriction on company size – the companies involved had to employ more than 10 individuals – to achieve a balanced sample. In addition, the survey used the taxonomy outlined in *Market Trends in Virtualization Infrastructure and Software, 2016: Market Background Report* (IDC #US41937616, November 2016).

*Note: All numbers in this document may not be exact due to rounding.*

## SITUATION OVERVIEW

The server virtualization market has gone through a massive expansion ever since VMware released its first x86 server virtualization offering back in 2001. This market was nascent at that point, and it was not until 2008 when Microsoft released its competing Hyper-V offering as part of Windows Server 2008 that users started heavily adopting the technology in their datacenters. Fast-forward to 2016 and the virtualization market has reached high levels of maturity and even saturation in some of the more developed regions like the United States, Western Europe, and even Japan. Indeed, the technology has been adopted by enterprise clients across all verticals – and particularly among financial services, associated professional services, and information technology firms – as well as by large hyperscale companies like Amazon to support highly standardized environments that can flexibly respond to increased activity based on demand as well as decrease the need for extensive hardware purchases, thanks to increased server utilization rates. Tables 1 and 2 present a summary of the organizations that were interviewed by vertical and company size, respectively.

## TABLE 1

### Virtualization Technology Users by Vertical and Country (% of Respondents)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| Banking, insurance, and financial services | 23.1 | 21.0 | 25.6 | 24.0 | 26.8 | 24.4 |
| Process and discrete manufacturing | 16.0 | 19.0 | 14.0 | 16.5 | 4.9 | 12.2 |
| Professional services | 8.9 | 9.8 | 7.0 | 9.1 | 7.3 | 7.3 |
| Information technology | 6.7 | 7.3 | 9.3 | 2.5 | 9.8 | 9.8 |
| Communication | 6.2 | 5.9 | 7.0 | 5.0 | 9.8 | 7.3 |
| Retail trade | 5.8 | 7.3 | 4.7 | 4.1 | 2.4 | 7.3 |
| Resources and construction | 4.7 | 2.9 | 7.0 | 7.4 | 4.9 | 2.4 |
| Education | 4.7 | 4.4 | 7.0 | 5.0 | 4.9 | 2.4 |
| Healthcare | 4.4 | 3.9 | 2.3 | 6.6 | 4.9 | 2.4 |
| Government | 4.4 | 3.9 | 2.3 | 5.0 | 4.9 | 7.3 |
| Transportation | 3.8 | 3.4 | 2.3 | 4.1 | 7.3 | 2.4 |
| Wholesale | 3.3 | 3.4 | – | 3.3 | 4.9 | 4.9 |
| Datacenter hosting provider | 2.7 | 3.9 | 2.3 | – | 2.4 | 4.9 |
| Utilities | 2.2 | 2.4 | 2.3 | 1.7 | 2.4 | 2.4 |
| Personal and other services | 2.0 | 1.0 | 4.7 | 2.5 | 2.4 | 2.4 |
| Datacenter colocation | 1.3 | 0.5 | 2.3 | 3.3 | – | – |
| Valid n = | 451 | 205 | 43 | 121 | 41 | 41 |

Source: IDC's *Virtualization Market Survey,* August 2016

## TABLE 2

### Virtualization Technology Users by Company Size and Country (% of Respondents)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| 10–99 employees | 24.4 | 24.4 | 23.3 | 24.8 | 24.4 | 24.4 |
| 100–499 employees | 24.6 | 24.9 | 23.3 | 24.8 | 24.4 | 24.4 |
| 500–999 employees | 21.3 | 22.9 | 20.9 | 21.5 | 19.5 | 14.6 |
| 1,000–4,999 employees | 21.3 | 20.0 | 20.9 | 21.5 | 24.4 | 24.4 |
| 5,000–9,999 employees | 5.1 | 4.4 | 9.3 | 3.3 | 4.9 | 9.8 |
| 10,000–24,999 employees | 2.2 | 2.4 | 2.3 | 2.5 | – | 2.4 |
| 25,000+ employees | 1.1 | 1.0 | – | 1.7 | 2.4 | – |
| Valid n = | 451 | 205 | 43 | 121 | 41 | 41 |

Source: IDC's *Virtualization Market Survey,* August 2016

IDC's market survey of the server virtualization market finds that most companies around the world rely on virtualization software quite extensively and at a very mature rate. For instance, for all of the talk regarding some applications not being deployed on virtual machines because of security concerns, IDC's survey found that users of virtualization software and related infrastructure, on average, are comfortable with deploying more than 80% of their workloads on hypervisors, deeming less than 20% of workloads as "not good candidates for virtualization." In brief, most mainstream enterprise-scale IT operations are in the later stages of virtualization technology implementation, and most of these users are making full use of the virtualization stack.

Any study on virtualization software in 2016 has to involve a discussion on containers, and IDC's survey of the virtualization market also included a few questions regarding plans to deploy this more nascent technology. Despite all of the hype around containers, this lightweight technology has yet to make a negative impact on the virtualization market. According to our survey, less than 3% of users of virtualization technologies across the world have actually deployed containers in production, although the interest is high across the board (>80%). Although the survey did not address this specific question, IDC believes, based on research on container technologies, that most of these users of containers are actually deploying their containers inside of virtual machines.

## Virtualization Rates and Virtual Machine Densities Are Similar Across Geographies

IDC's research shows that virtualization rates do not vary that much by country. Despite the fact that the United States, as well as developed regions like Western Europe and Japan, has traditionally had a first-mover advantage when it came to adopting new technologies, enterprise IT departments in emerging powerhouses like India, Brazil, and especially China have clearly invested in virtualization infrastructure to catch up to, and in some instances even surpass, virtualization deployments in the West. According to our survey, the virtualization rate worldwide is about 35%, in line with currently published IDC research. The U.S. and Russia rates are slightly above and the rates for Brazil and India are slightly below this average rate. China's virtualization rate, as supported by our survey results, more or less matches the worldwide average. Moreover, IDC research and survey results show that rates of virtualization across both public and private clouds are also comparable across these countries. Last, although not included in Table 3, IDC's survey also pointed to continuous growth in the virtualization rate over the next 12 months. However, these results are not presented in this document since the results represent intentions rather than commitments to virtualize more servers.

### TABLE 3

**Virtualization Rates by Country (%)**

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| Mean percentage | 34.9 | 36.0 | 28.2 | 35.1 | 38.8 | 32.4 |

n = 451

Source: IDC's *Virtualization Market Survey,* August 2016

In addition to comparable rates of virtualization, these deployments also supported a similar amount of virtual machine densities across the varying geographies. Once again, the average VM densities worldwide amounts to 11.19 for 2016, which lines up well with previous IDC research on VM densities and points to steady, continuous growth (see Table 4). The U.S. VM density average, according to our survey, is actually slightly below this value but within a small margin of error, whereas the China VM density average is somewhat above, pointing to increased deployment by larger enterprises in that region — the assumption being that larger enterprises generally support greater VM deployments, which in turn lead to higher VM densities. Like with the virtualization rate, IDC's survey also pointed to continued healthy growth in the VM density across all regions over the next 12 months, although these results again represent intentions and no firm commitments.

## TABLE 4

### Average Virtual Machine Densities by Country

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| Mean number | 11.19 | 10.65 | 10.76 | 12.20 | 11.18 | 11.32 |

n = 451

Source: IDC's *Virtualization Market Survey,* August 2016

Two questions arise from these results. First, why are virtualization rates and VM densities so similar across geographies? IDC research shows that virtualization technology, although available for over 15 years at this point, only started being adopted in meaningful deployments starting in 2008. As the emerging economies had already achieved sustained economic growth by this stage, it is very likely that enterprises in these economies merely skipped the era of non-virtualized deployments and instead moved on to reap the benefits of virtualization – namely, increased server utilization and deployment flexibility and the cost savings that come from those two. It also helped that VMware and Microsoft, the two main players in this space, made their offerings available in overseas markets early on.

The impact of containers on both virtualization rates and VM densities is another question that arises from these results. In particular, if containers are meant to replace virtual machines in the datacenter and across public clouds, why do this survey and other IDC research point to continued growth across both virtualization rates and VM densities? The answer to this question is complicated. The first piece is that containers are not yet being widely adopted in production, a position supported by both this survey and IDC research into the container market. In addition, most planned container deployments are still being done within virtual machines, which provide security isolation benefits that most container engines still lack. This is useful not only within private datacenters but more so for the public cloud, where multitenancy could easily lead to security threats spreading from one customer's workloads to another's. Therefore, while containers, if deployed on bare metal, could one day replace virtual machines, the near future of the success of containers is at least partially tied to the success of virtualization deployments.

## Virtualization Across CPU Types and Form Factors Is Generally Consistent with the Server Market

According to IDC's survey of virtualization users, the benefits of virtualization are being enjoyed by users of x86 and non-x86 servers alike. In Table 5, it is clear that the distribution of users of virtualization for both CPU types closely follows the current distribution in the overall server market. While India's split is somewhat different than the other regions, the values are close enough to the worldwide average, and the sample size is small enough to assume a similar trend in that country.

## TABLE 5

### Distribution of Virtualization Between x86 and Non-x86 Servers (%)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| x86 | 83.5 | 83.4 | 77.6 | 83.5 | 88.8 | 85.6 |
| Non-x86 | 16.5 | 16.6 | 22.4 | 16.5 | 11.2 | 14.4 |
| Valid n = | 451 | 205 | 43 | 121 | 41 | 41 |

Source: IDC's *Virtualization Market Survey,* August 2016

The same pattern is seen in the distribution of form factors on which virtualization software is deployed. The only exception to this rule is the density-optimized form factor, an exception that is not surprising upon closer inspection. These servers often form the backbone for the compute powering several of the world's largest public clouds, including Google Cloud Platform, Microsoft Azure, and Amazon Web Services. Some of these users eschew virtualization in favor of homegrown technologies; Google, for instance, deploys most of its workloads on containers. The clout that these cloud providers have on the density-optimized server market, and their eschewing of server virtualization software in favor of other technologies, at least partially explains the low percentage of this form factor that is currently virtualized (see Table 6).

## TABLE 6

### Form Factor Distribution of Virtualized Servers (% of Respondents)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| Tower | 9.5 | 9.8 | 4.7 | 10.7 | 9.8 | 9.8 |
| Rack optimized | 39.5 | 45.9 | 18.6 | 33.9 | 43.9 | 41.5 |
| Blade | 27.3 | 27.3 | 30.2 | 30.6 | 24.4 | 17.1 |
| Density optimized | 4.7 | 2.4 | 4.7 | 3.3 | 14.6 | 9.8 |
| Converged infrastructure | 7.8 | 6.3 | 18.6 | 7.4 | 2.4 | 9.8 |
| Hyperconverged infrastructure | 11.3 | 8.3 | 23.3 | 14.0 | 4.9 | 12.2 |
| Valid n = | 451 | 205 | 43 | 121 | 41 | 41 |

Source: IDC's *Virtualization Market Survey,* August 2016

An interesting observation is the growing importance of both converged and hyperconverged infrastructure. As both offerings form a growing part of the server and storage markets, it is unsurprising to see that virtualization software is often layered on top of the offering. Given that the impetus behind converging infrastructure is to increase utilization and efficiency, the next logical step would be to continue down that path by deploying hypervisors on top of optimized hardware. IDC's survey reflects this logic across most geographies and particularly so in India.

The rest of this study focuses largely on the x86 portion of the server virtualization market as this segment makes up the bulk of the revenue opportunities for vendors.

## VMware and Microsoft Continue to Lead the Virtualization Market, with Oracle, Citrix, and Red Hat Far Behind

IDC's survey supports VMware's continued dominance in the hypervisor market for x86 servers. According to our survey, almost 30% of users of virtualization software relied on a paid version of VMware's hypervisor offering, vSphere, as their primary hypervisor. This proportion of paid users holds fairly constantly except in India, where paid users of VMware are only about 17% of the market. The proportion of VMware users worldwide rises to almost 45% if one includes the free versions of vSphere that are also offered by the company. Again, India, in general, lags behind the rest of the world, with VMware at less than 40% of the market there, which might point to a greater reliance on free or less expensive solutions in that particular country.

VMware's main rival in the server virtualization market is Microsoft. Indeed, Microsoft's paid offering, Windows Server subscriptions that include Microsoft's Hyper-V hypervisor, accounts for more than 20% of installments worldwide. While that proportion decreases somewhat in certain markets like India (at 15.9%), Microsoft's offerings are clearly valued and seriously considered by IT departments across the world. The firm's share increases if we take into account users of the free version of Hyper-V (without any Windows Server license and/or support from Microsoft), rising to over 30% of the market.

Different versions of Xen and KVM hypervisors make up the rest of the market. Table 7 outlines the shares held by Oracle, Citrix, and Red Hat, with all three being tapped as the provider of the main hypervisor of the firm by 7–8% of users each. While not insignificant, these shares are nevertheless small compared with the two incumbents; combined, they do not even reach Microsoft's share of the market. Moreover, the use of Oracle VM, Citrix Xen, or Red Hat KVM has rarely translated into revenue market share for any of these firms. Although not shown in Table 7, on a market share basis, VMware actually controls more than 80% of the market, with Microsoft taking the lion's share of the rest. Like Microsoft, these companies derive most of their revenue from associated products like database technology (Oracle), client virtualization offerings (Citrix), and open source software (Red Hat).

## TABLE 7

### Primary Hypervisor Deployed on Virtualized x86 Servers (% of Respondents)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| VMware ESX/ESXi/vSphere | 29.5 | 34.9 | 17.2 | 23.7 | 34.9 | 26.7 |
| VMware vSphere Hypervisor/Server (free version) | 14.9 | 14.8 | 19.0 | 16.4 | 7.1 | 14.0 |
| Microsoft Hyper-V (paid, included in Windows Server 2008/2012) | 20.1 | 20.6 | 15.9 | 18.8 | 23.3 | 23.2 |
| Microsoft Hyper-V Server/Virtual Server (free version) | 11.2 | 8.5 | 17.0 | 14.0 | 11.2 | 10.7 |
| Oracle VM for x86 (Xen based) | 7.7 | 5.7 | 14.0 | 7.7 | 9.6 | 9.3 |
| Red Hat Enterprise Virtualization (KVM/Xen) | 7.3 | 4.9 | 8.0 | 11.4 | 5.7 | 8.4 |
| Citrix XenServer | 7.1 | 8.8 | 6.9 | 5.4 | 5.5 | 4.9 |
| Parallels Cloud Server/Virtuozzo | 1.6 | 1.3 | 1.5 | 2.5 | – | 1.8 |
| Other KVM | 0.4 | 0.2 | – | 0.3 | 2.6 | 0.5 |
| Other Xen | 0.2 | 0.3 | 0.5 | – | 0.1 | 0.5 |
| Valid n = | 451 | 205 | 43 | 121 | 41 | 41 |

Source: IDC's *Virtualization Market Survey,* August 2016

VMware's dominance in the market is impressive and is grounded in vSphere's demonstrated capabilities, trustworthiness, and cost efficiency vis-à-vis non-virtualized environments. As VMware is a pioneer in this market, most enterprises around the world today are very familiar with the vendor's hypervisor offerings. In addition to the hypervisor, VMware has been able to extract value by extending its product portfolio to associated markets including operations management, public cloud availability, and even OpenStack integration. Table 8 shows that of existing vSphere customers, less than 15% on average do not purchase another VMware product alongside the ESX/ESXi subscription. Unsurprisingly, vCenter Server is among the more popular products that are often attached to purchases of vSphere.

## TABLE 8

### Attach Rate for Other VMware Products (% of Respondents)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| vCenter Server | 37.3 | 38.4 | 42.9 | 35.2 | 33.3 | 35.7 |
| VMware Integrated OpenStack | 36.3 | 31.9 | 64.3 | 39.8 | 25.0 | 28.6 |
| vCloud Suite | 22.9 | 25.4 | 25.0 | 20.5 | 4.2 | 32.1 |
| vRealize Automation | 18.6 | 11.6 | 28.6 | 29.5 | 4.2 | 21.4 |
| vRealize Operations | 17.6 | 17.4 | 28.6 | 19.3 | 4.2 | 14.3 |
| Site Recovery Manager | 17.0 | 16.7 | 7.1 | 18.2 | 16.7 | 25.0 |
| vRealize Suite | 14.4 | 8.7 | 28.6 | 17.0 | 12.5 | 21.4 |
| vSAN | 13.1 | 10.1 | 17.9 | 15.9 | 12.5 | 14.3 |
| NSX | 12.4 | 6.5 | 32.1 | 9.1 | 29.2 | 17.9 |
| None of these | 14.7 | 19.6 | – | 11.4 | 12.5 | 17.9 |
| Valid n = | 306 | 138 | 28 | 88 | 24 | 28 |

Source: IDC's *Virtualization Market Survey,* August 2016

In a market that seems at first glance to be completely dominated by two large incumbents (VMware and Microsoft), there is an opportunity for vendors in the move toward multi-hypervisor environments. Table 9 outlines the intention of vendors to deploy more than one hypervisor from a different vendor, with this opportunity representing almost 65% of the market. Although not shown in Table 9, Red Hat KVM, Citrix Xen, and Oracle VM were preferred choices for a second (or third) hypervisor deployment. In fact, only 11.5% of users worldwide seemed set on standardizing on one hypervisor alone, preferring to focus the deployment of their primary virtualized workloads on a primary hypervisor while deploying secondary workloads on an additional virtualization solution. More importantly for vendors, this opportunity for being the second hypervisor in a datacenter deployment is even higher in less mature, but potentially faster-growing, economies like India, China, and Brazil.

## TABLE 9

### Plans to Adopt Multiple Hypervisors on Virtualized Servers (% of Respondents)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| Currently deploy more than one hypervisor from a different vendor | 28.8 | 26.3 | 39.5 | 31.4 | 22.0 | 29.3 |
| Planning to deploy an additional hypervisor from a different vendor | 35.7 | 23.4 | 46.5 | 48.8 | 31.7 | 51.2 |
| No plans to deploy additional hypervisors | 23.9 | 36.6 | 11.6 | 12.4 | 14.6 | 17.1 |
| Planning to standardize on one hypervisor from a single vendor | 11.5 | 13.7 | 2.3 | 7.4 | 31.7 | 2.4 |
| Valid n = | 451 | 205 | 43 | 121 | 41 | 41 |

Source: IDC's *Virtualization Market Survey,* August 2016

## Cost Savings and Increased Server Utilization, Rather than Containers, Drive Virtualization Software Adoption

One of the main benefits of deploying virtualization software and infrastructure in a private datacenter or a public cloud is the cost savings associated with said deployment. Across the world, users of these technologies report savings of almost 20% from deploying hypervisors on their existing servers, with the proportion more or less holding steady across the geographies surveyed (see Table 10). As shown in Table 11, many of these savings naturally come from not having to purchase extra hardware to cope with fluctuating demand on workloads; more than 65% of respondents cited this as an area of savings. In addition, a decrease in rent space (>60%) and lower energy expenses (>48%) were also cited as major areas where virtualization technologies helped decrease costs. Last, the need for fewer personnel to administer fewer physical servers (the server-to-admin ratio) was a major area of cost savings for these users of virtualization; the productivity increases that came from virtualization were almost as important (64.3%) as the savings from fewer physical server purchases.

## TABLE 10

### Overall Savings as a Percentage of IT Budget Delivered by Using Virtualization Technologies (Mean %)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| Mean average (%) | 19.5 | 18.5 | 21.0 | 19.8 | 20.0 | 21.4 |

n = 451

Source: IDC's *Virtualization Market Survey,* August 2016

## TABLE 11

### Areas of Costs Savings from Virtualization (% of Respondents)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| Datacenter space/cost or deferred additional datacenter buildout | 60.6 | 51.2 | 69.8 | 71.4 | 65.8 | 61.0 |
| Energy expense (power/cooling) | 48.2 | 47.3 | 51.2 | 41.2 | 57.9 | 61.0 |
| Server hardware | 65.8 | 70.6 | 58.1 | 61.3 | 68.4 | 61.0 |
| IT administrator productivity (the server-to-admin ratio) | 64.3 | 58.2 | 79.1 | 66.4 | 71.1 | 65.9 |
| Other (specify) | 0.2 | 0.5 | – | – | – | – |
| Valid n = | 442 | 201 | 43 | 119 | 38 | 41 |

Source: IDC's *Virtualization Market Survey,* August 2016

Another major factor leading to increasing virtualization rates has been the positive impact that virtualization technology has on server utilization rates (see Table 12). More than 90% of survey respondents stated that virtualization has increased their server utilization rates. While the vast majority of users worldwide (60.3%) cited increased server utilization rates of 25–75%, a growing proportion worldwide (6.7%) cited improvements in these rates of 75% to more than 100%. The situation is relatively the same throughout all of the geographies we surveyed, although no users in India reported improvements of more than 75%.

## TABLE 12

### Increased Server Utilization Rates from Virtualization (% of Respondents)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| Not at all | 8.6 | 13.7 | 4.7 | 5.8 | 4.9 | – |
| Increased by less than 25% | 24.4 | 27.3 | 25.6 | 23.1 | 19.5 | 17.1 |
| Increased by 25–50% | 44.3 | 39.5 | 51.2 | 52.9 | 34.1 | 46.3 |
| Increased by 50–75% | 16.0 | 13.7 | 18.6 | 12.4 | 26.8 | 24.4 |
| Increased by 75–100% | 4.9 | 2.4 | – | 5.0 | 14.6 | 12.2 |
| Increased by more than 100% | 1.8 | 3.4 | – | 0.8 | – | – |
| Valid n = | 451 | 205 | 43 | 121 | 41 | 41 |

Source: IDC's *Virtualization Market Survey,* August 2016

## Users of Hypervisors Are Increasingly Virtualizing Their Workloads, But There Is Room for Growth

Users of hypervisors across the world reported that they are virtualizing about 25.5% of their workloads in 2016, according to IDC's survey on the virtualization market. The distribution for workloads virtualized is very centralized, with over 90% of users worldwide and on a country basis reporting that they virtualize 11-40% of their workloads. Only a few users (<10% in the United States, India, China, and Russia and 0% in Brazil) reported virtualizing less than 10% of their workloads, suggesting that enterprises using virtualization software are serious about reaping the benefits brought by the hypervisor (see Table 13).

## TABLE 13

### Percentage of Total Applications/Workloads Currently Virtualized (% of Respondents)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| 1–10% | 8.0 | 9.3 | 9.3 | 9.9 | 2.4 | – |
| 11–25% | 45.5 | 45.4 | 44.2 | 42.1 | 53.7 | 48.8 |
| 26–40% | 45.5 | 43.9 | 44.2 | 47.9 | 43.9 | 48.8 |
| >40% | 1.1 | 1.5 | 2.3 | – | – | 2.4 |
| Valid n = | 451 | 205 | 43 | 121 | 41 | 41 |
| Mean average (%) | 25.5 | 25.6 | 25.4 | 25.1 | 25.3 | 27.0 |

Source: IDC's *Virtualization Market Survey,* August 2016

A bright spot for vendors in what would otherwise seem like a mature market is that there are plenty more workloads that can still be virtualized. Only 1.1% of users worldwide reported having virtualized more than 40% of their workloads. Moreover, survey respondents said that only 18.6% of their workloads were not good candidates for virtualization — business application, data management, and IT infrastructure workloads were named as some of the workloads not eligible for virtualization, although no specific tools were mentioned (see Table 14). This potentially opens up 55% of existing non-virtualized workloads to be virtualized in the near and medium term. The advent of containers does not fundamentally change this outlook either as at least a portion of these workloads (generally cloud-native ones) would be deployed inside of containers, which in turn would be deployed inside a virtual machine.

## TABLE 14

### Percentage of Workloads That Are Not Good Candidates for Virtualization (Mean %)

| | Total | United States | India | China | Russia | Brazil |
|---|---|---|---|---|---|---|
| Mean average (%) | 18.6 | 16.5 | 21.9 | 20.6 | 17.8 | 21.1 |

n = 451

Source: IDC's *Virtualization Market Survey,* August 2016

## FUTURE OUTLOOK

IDC's analysis of enterprise customer feedback, concerns, and priorities points to continued resilience and growth in the adoption of virtualization technology as well as an increase in the number of workloads that will eventually become virtualized. Most enterprises are looking for hypervisors to make their workload deployments flexible, portable, and secure simultaneously. Cost savings related to increased server utilization and greater staff productivity as well as business agility are the main benefits that will continue to drive this growth.

It is important to note that while there are few differences in the adoption rates among the five countries IDC surveyed, there are a few key similarities that are striking. The first is the fact that virtualization rates and VM densities are generally as high in the BRIC nation as they are in the United States and the rest of the Western world. This suggests that the former economies, perhaps because of sustained economic growth, have been able to largely bypass the non-virtualized era and leap forward to adopting the latest virtualization technologies. Second, the same rates of workload virtualization are generally visible in all of the countries we surveyed, too. Most enterprises appear to virtualize 11–40% of their workloads, with a few moving above or below, yet the survey also shows that across the five countries, these same clients are open to virtualizing more than 80% of their workloads, suggesting that there is room for growth across the world.

Some differences at the regional level also jump out. The most important, although not explicitly stated, is around cost. IDC's survey revealed that cost seems to be a greater consideration for

enterprises in India than in the other countries of the world. This is not too surprising as India has by far the lowest GDP per capita of the nations that we surveyed. Logically, this seems to suggest that hypervisor vendors that offer lower-cost offerings (including Red Hat, Citrix, and even Microsoft) have a chance to steal market share away from incumbent VMware.

## ESSENTIAL GUIDANCE

IDC expects despite inhabiting a fairly mature segment of the datacenter market, there are still substantial revenue opportunities for vendors of virtualization and associated management solutions to explore. A few key points have led to this conclusion:

- The virtualization rate and VM densities continue to increase across regions as more users seek to reap the benefits of virtualizing their workloads, leading to at least continuous, if tepid, yearly growth.
- Users are open to virtualizing more than 80% of their workloads yet have only virtualized 25.5% thus far, suggesting opportunities for established vendors to sell more licenses/subscriptions.
- Container deployments are set to occur at least partially on top of the hypervisor, suggesting an important continuing role for the latter in the future of virtualizing workloads/applications.
- Some price-sensitive regions of the world are seeking free or lower-cost solutions, suggesting an opening for vendors with such solutions (Red Hat, Citrix, and Microsoft) to take share away from VMware.
- Continuous GDP growth, especially among BRIC and other emerging economies, will present future growth opportunities for vendors with an established reputation and network as well as with a quick response.
- Feature parity among hypervisor offerings (with the exception of native container support on the latest version of Citrix XenServer) means that opportunities will open up depending on established client bases and networks as well as aggressiveness in pursuing new markets. This attribute favors established incumbents over rising challengers.

IDC expects many enterprise departments to look to established virtualization vendors to provide tested solutions as well as deployment strategies as these departments seek to continue to increasingly virtualize their not-as-yet virtualized applications and/or deploy containers with cloud-native applications in a secure fashion. Coupled with the fact that most enterprises will continue to rely on multiple clouds and multiple application and infrastructure technologies for the foreseeable future, IDC expects the majority of enterprises to rely on solutions that can integrate their current production workloads rather than implement entire solutions from the ground up.

## LEARN MORE

### Related Research

- *Market Trends in Virtualization Infrastructure and Software, 2016: Market Background Report* (IDC #US41937616, November 2016)
- *VMworld 2016: VMware Converges Software Defined and Lays Out Container Vision* (IDC #IcUS41729416, September 2016)
- *IDC's Container Infrastructure Software Ecosystem Taxonomy and Overview, 2016* (IDC #US41401716, June 2016)

- *Citrix Continues to Invest in XenServer* (IDC #US41464816, June 2016)
- *IDC's Worldwide Computing Platforms Taxonomy, 2016* (IDC #US40861916, April 2016)
- *Friend or Foe: The Intersection of Containers and Virtualization* (IDC #US40697916, March 2016)
- *VMworld 2015: Going Deeper and Wider* (IDC #258904, September 2015)

## Synopsis

This IDC study is the second of three deliverables that constitute IDC's special study titled *Market Trends in Virtualization Infrastructure and Software, 2016*. This specific document discusses IDC's findings from a market survey of 451 users of virtualization technology. It summarizes the current level of market maturity for virtualization infrastructure and software and identifies a number of important planning assumptions made by IT decision makers as they equip their departments to deploy new workloads in the near- to medium-term future.

"Interest in virtualization solutions continues to be high among established users," says Jorge Vela, senior research analyst, Computing Platforms. "While most offerings have reached feature parity with one another, we believe that there is still opportunity for moderate growth in this market. Increasing rates of virtualization among existing users, coupled with openness to further virtualize existing workloads and deploy containers atop of hypervisors, ground our confidence in the future revenue opportunities for vendors outlined in this document."

## 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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