

Market Share

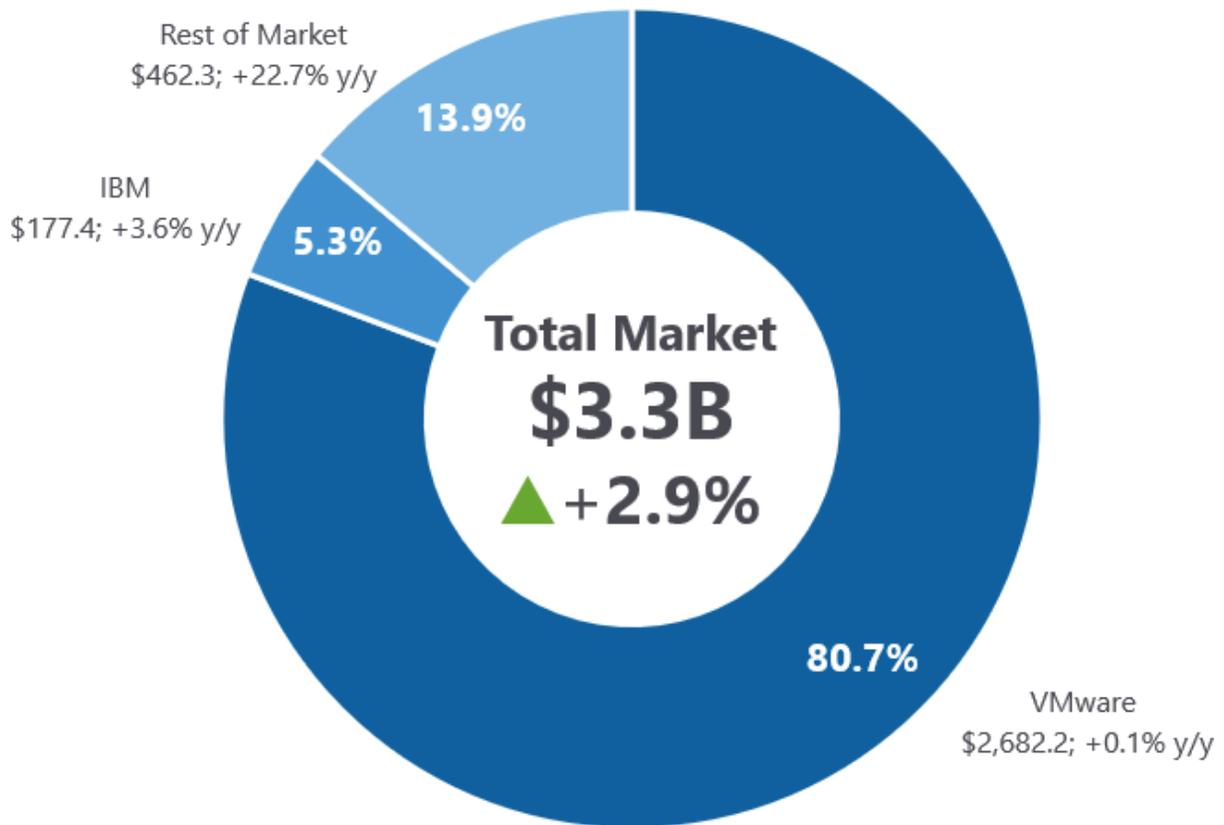
Worldwide Virtual Machine Software Market Shares, 2017: Virtualization Still Showing Positive Growth

Gary Chen

IDC MARKET SHARE FIGURE

FIGURE 1

Worldwide Virtual Machine Software 2017 Share Snapshot



Note: 2017 Share (%), Revenue (\$M), and Growth (%)

Source: IDC, 2018

EXECUTIVE SUMMARY

2017 saw an increase in the virtual machine software (VMS) market as VMware's compute business showed better than expected resiliency. Specifically:

- Worldwide revenue for the VMS market was \$3.32 billion in 2017, representing an increase of 2.9%.
- The top 3 vendors in 2017 based on worldwide revenue were VMware, IBM, and Huawei, together accounting for 89.6% of the market total.
- The virtualization market is very mature and facing trends of saturation and commoditization. The emergence of containers and cloud system software (CSS) is also changing the dynamics and revenue allocations of this market.

This IDC study examines the market share of virtual machine software vendors in 2017 as well as the market forces that influenced their performances. Virtual machine software is a competitive market in IDC's software taxonomy and a submarket of the software-defined compute (SDC) software market. Virtual machine software includes hypervisor revenue derived from traditional server virtualization deployments and does not include hypervisor revenue that is bundled with cloud system software for cloud deployments.

"The VMS market has shown better than expected resiliency in the face of saturation, cloud, and containers," says Gary Chen, research manager, Software-Defined Compute. "Virtualization is still the core compute foundation for the datacenter, but the role of the hypervisor is beginning to change."

ADVICE FOR TECHNOLOGY SUPPLIERS

The market for VMS showed an increase of 2.9% in 2017, which is a positive sign given the stage of the market today. While virtual machine software makes up a large majority of the SDC software market, containers and cloud system software are the future, and these three technologies are tightly intertwined. IDC offers the following guidance to vendors offering solutions in the virtual machine software market:

- **Thriving ecosystems are force multipliers for system software platforms.** A large ecosystem is a huge competitive advantage for system software, and building ecosystems takes a lot of time. It is critical for success to prioritize how to be a good, open partner and attract people who will want to build on and enhance your platform. Vendors that can find a way to partner well, even in the face of competitive conflict, will enhance the value of their platform and give customers more faith in investing in that platform.
- **Container integration is key to gaining share in next-generation applications.** There will be a mix of containers and virtual machines (VMs) for the foreseeable future. Many existing applications will continue to run in VMs until they are decommissioned, and some new applications will run in bare metal containers. However, there will also be a huge overlap of containers and virtual machine software, with most containers running inside VMs. Customers will continue to have a varied mix of how they use VMs and containers, and vendors will have to accommodate multiple software-defined compute scenarios. Containers will not necessarily replace VMs, but they will greatly change the hypervisor's role and value. Virtual machine software vendors need to offer integration and value for container workloads as well as include or integrate with popular container orchestration and management platforms.

- **Strategies should focus on full-stack solutions.** Tomorrow's modern cloud infrastructure and next-generation apps will be built on a software stack of many complex layers that includes hypervisors, operating systems, containers, cloud system software, automation and orchestration software, management software, developer tools, and platform as a service. Many vendors will seek to own as much of this stack as possible, but many customers will want more than one option, and partnerships around certain layers of this stack will be necessary. The end result is that customers want less piece parts and tested and integrated solutions. But customers are also cautious of lock-in, openness, and lack of flexibility. This can be a very tricky balance to achieve, but vendors that can successfully toe this line will find success with customers.

MARKET SHARE

The worldwide VMS market grew 2.9% to \$3.32 billion in 2017 primarily because of VMware's continuing strength in compute. However, VMware's business model is evolving to selling large bundles that include the core platform along with various management software, storage, networking, and cloud system software, and the value in these bundles is shifting toward other emerging areas. However, from a shipment point of view, VMware virtualization platforms are still growing, albeit slower than in past years because of market saturation, public cloud, and new technologies such as containers. Refer back to Figure 1 for the top 2 vendors by revenue share. Table 1 provides revenue, growth, and share of the leading VMS vendors from 2015 through 2017. The top 5 vendors measured by share of revenue were VMware (80.7%), IBM (5.3%), Huawei (3.6%), Hewlett Packard Enterprise (HPE) (1.8%), and Oracle (1.5%), together accounting for 92.9% of total revenue. The majority of vendors bundle virtualization as a feature of an operating system or a cloud bundle or platform, thus impacting revenue recognition in this market.

TABLE 1**Worldwide Virtual Machine Software Revenue by Vendor, 2015-2017 (\$M)**

	2015	2016	2017	2017 Share (%)	2016–2017 Growth (%)
VMware	2,825.4	2,680.5	2,682.2	80.7	0.1
IBM	191.5	171.3	177.4	5.3	3.6
Huawei	86.2	99.8	118.1	3.6	18.4
Hewlett Packard Enterprise	56.4	51.5	59.0	1.8	14.5
Oracle	39.8	47.7	49.0	1.5	2.8
Citrix	25.7	32.5	47.1	1.4	44.9
Microsoft	20.0	22.3	23.0	0.7	3.1
H3C	10.5	12.3	20.2	0.6	64.8
Red Hat	10.7	13.2	17.1	0.5	29.4
Inspur	4.1	7.1	10.4	0.3	47.0
Easted	0.8	1.7	2.3	0.1	36.2
Winhong	1.0	1.4	1.8	0.1	27.9
Other	51.1	87.4	114.3	3.4	30.8
Total	3,323.3	3,228.7	3,322.0	100.0	2.9

Source: IDC's Worldwide Semiannual Software Tracker, November 2018

Growth leaders in 2017 were H3C (64.8%), Inspur (47.0%), and Citrix (44.9%). Note that these vendors are growing off small bases. Citrix and Oracle have found niches in the market for desktop virtualization and Oracle business applications and Oracle appliances. Inspur is a recently added company model and shows growth of virtualization in China, particularly open source virtualization that is based on KVM.

WHO SHAPED THE YEAR

VMware generated 80.7% of the revenue in this market in 2017 and thus has a huge impact on VMS. VMware's compute business has performed better than expected and has been resilient to competitive

and evolving technology factors. While virtualization shipments have not declined, the rate of growth has slowed considerably as mature regions are reaching saturation. Other factors are that next-generation applications build on containers and cloud are commoditizing the hypervisor.

Other than VMware, open source is the next largest competitor with most of the rest of the market based on either KVM or Xen. Open source also makes up a large amount of cloud and service provider deployments that often don't generate revenue as they are self-supported. China in particular has seen a recent explosion in the number of vendors offering commercial versions of the KVM hypervisor, with Huawei leading the pack. IBM is the primary non-x86 virtualization provider, providing both proprietary and KVM-based solutions. These solutions have a high attach rate to Power and z Systems, and Power has seen a recent uptick due to its performance in analytics, AI, and ML.

MARKET CONTEXT

The software-defined compute software market includes three areas of compute technology, which are closely related: hypervisor-based virtualization (virtual machine software), container-based virtualization (container infrastructure software), and cloud system software (compute system software for building clouds). The overwhelming majority of the revenue in SDC is generated by virtual machine software and primarily by VMware.

The questions for VMS going forward deal with revenue generation and allocation. Virtualization is a mature market, and VM technology will be an important foundation for years to come. However, VMware is the only vendor that generates significant revenue from standalone virtualization sales, and VMware has already acknowledged that compute is slow growth market at this point. Most competitors embed their products into operating systems or cloud system software and generate far less direct revenue. If competitors gain more share or revenue, it only has a small effect on the VMS market, as the revenue from these embedded or bundled hypervisors is relatively small compared with VMware. VMware is also moving to selling more bundles which shifts the value out of the hypervisor and into management and other growth areas. In addition, hypervisor revenue that is attached to cloud system software is now represented in the cloud system software market. So as deployments move to cloud, VMS will decline as it only represents traditionally managed virtualization. Also, as VMs move from on-premises to public cloud, this revenue shifts from software to services and would not be represented in the VMS market, even though cloud providers are using hypervisors in their infrastructure. Thus, from a revenue perspective, significant revenue may drain out of VMS over time and a shipment view will be key to understand this market.

Significant Market Developments

VMware generates the large majority of revenue in this market, and thus any changes to its business or selling model have a significant impact on the VMS market. While VMware hypervisor sales remain healthy and positive, VMware has continued to increasingly move to bundled products. These products focus on high-growth areas of private cloud software, management, and other virtualization technologies in storage/networking. These bundles shift value and revenue out of VMS and into other markets, although hypervisors remain a core part of the bundle. As VMware moves to cloud products, these products and attached hypervisors are recognized in the cloud system software market. Thus increases in cloud selling will shift revenue out of the VMS market and into the CSS market, although overall hypervisor shipments and usage may be unaffected.

METHODOLOGY

The IDC software market sizing and forecasts are presented in terms of commercial software revenue. IDC uses the term *commercial software* to distinguish commercially available software from custom software. Commercial software is programs or codesets of any type commercially available through sale, lease, rental, or as a service. Commercial software revenue typically includes fees for initial and continued right-to-use commercial software licenses. These fees may include, as part of the license contract, access to product support and/or other services that are inseparable from the right-to-use license fee structure, or this support may be priced separately. Upgrades may be included in the continuing right of use or may be priced separately. These are counted by IDC as commercial software revenue.

Commercial software revenue excludes service revenue derived from training, consulting, and systems integration that is separate (or unbundled) from the right-to-use license but does include the implicit value of software included in a service that offers software functionality by a different pricing scheme. It is the total commercial software revenue that is further allocated to markets, geographic areas, and operating environments. The worldwide software market includes all commercial software revenue across all functional markets or market aggregations.

For further details, see *IDC's Worldwide Software Taxonomy, 2018* (IDC #US44220818, September 2018). Bottom-up/company-level data collection for calendar year 2017 began in January 2018, with in-depth vendor surveys and analysis to develop detailed 2017 company models by market, geographic region, and operating environment.

The data presented in this document is IDC estimates only.

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

MARKET DEFINITION

Virtual machine software (VMS), also known today as hypervisor software, either uses low-level capabilities offered by certain hardware environments or installs a complete hardware emulation layer using software to support multiple operating environments and the related stacks of applications, application development and deployment software, and system infrastructure software. This segmentation is often referred to as virtualization or partitioning. Each of the client or server operating environments is allowed to believe that it controls the entire machine, but resources are actually allocated on the basis of rules established either at the time of configuration or dynamically by related management software. Thus multiple operating systems, even those from different vendors, can now share the same machine without awareness of the proximity for other operating systems on the same physical hardware. Virtual machine software is most commonly installed on servers to host either server or desktop virtual machines (as the back end for centralized virtual desktops), but hypervisors are also increasingly being used on personal computing and mobile devices. Hypervisors also increasingly serve as the foundational infrastructure software for public and private clouds. Virtual machine software can be used by cloud service providers to provide virtual machines as a service.

RELATED RESEARCH

- *IDC's Worldwide Software Taxonomy, 2018* (IDC #US44220818, September 2018)
- *Market Analysis Perspective: Worldwide Software-Defined Compute, 2018* (IDC #US43407518, September 2018)
- *Worldwide Software-Defined Compute Software Market Shares, 2017: Virtualization Shows Resilience* (IDC #US43976818, June 2018)
- *Worldwide Virtual Machine Software Market Shares, 2016: Enterprise Virtualization Remains a Datacenter Mainstay* (IDC #US42136517, December 2017)

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Global Headquarters

5 Speen Street
Framingham, MA 01701
USA
508.872.8200
Twitter: @IDC
idc-community.com
www.idc.com

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