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Server Trends: New Technologies and Workloads Are Driving Refresh Cycles

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Adapted from *Worldwide Enterprise Server 2010 Top 10 Predictions* by Jean S. Bozman, Matthew Eastwood, Michelle Bailey, et al., IDC #221796 and *Worldwide and Regional Server 2010–2014 Forecast* by Lloyd Cohen, Daniel Harrington, Stefania Lorenz, et al., IDC #222605

Introduction

The worldwide server market saw a sharp downturn in 2009 as the economic downturn pushed revenue down by double digits compared with 2008. In 2009, unit shipments dipped below the 8-million-unit record set in 2008. IDC believes that the server market will see single-digit growth in 2010 and overall stabilization of demand for new servers.

And yet, there will be a new "normal" whose shape has not yet been seen in terms of the type of demand and product mix for 2010. New factors in the mix are increased virtualization of physical servers, more powerful multicore microprocessors with 8 or more cores, and new types of servers designed to meet new use-case requirements. At the same time, servers will increasingly be seen as the hardware foundation for a new wave of server-based solutions, aimed at running specific applications or databases.

IDC believes that a number of trends will emerge in 2010 — highlighting the role of new technologies that are influencing server adoption worldwide. From multicore processors to server virtualization to cloud-optimized designs, server products will evolve in 2010, and that trend will continue into the end of the forecast period in 2014. Vendors that can leverage new chip technologies will be able to provide dense computing capabilities to their customers, with new packaging and improved energy efficiency, and they will be positioned to grow with the market as it recovers.

Deployment patterns will change, too, as specialized, modular, energy-efficient datacenters are built out, following a period of delays and deferrals during the downturn of 2009. Aging servers will be replaced — whether they are deployed singly or in clusters. In some cases, there will be changes in the operating system and software "stacks" that accompany this server technology refresh cycle. In other situations, dense computing will allow replacement of

physically larger systems by smaller form factors, as high-end capabilities cascade into midrange systems at lower price points. There is opportunity for large SMP servers to be replaced by smaller, more compact servers running business-critical and mission-critical workloads. That trend will enable organizations to save on datacenter floor space, power/cooling costs, and — through virtualization/consolidation — maintenance costs for hardware and software.

Finally, blade systems will continue their growth trend and will return to faster growth rates than rack-optimized servers. Given the flexibility that IT organizations gain with blade deployments, IDC predicts healthy growth; IDC forecasts that blades are on a path to top 20% of all server unit shipments by 2011–2012. IDC notes that blade deployments are often accompanied by virtualization deployments, as workloads are consolidated onto a blade server chassis for easier, and more flexible, management than on standalone, rack-optimized servers.

Market Trends

A technology refresh cycle, combined with delayed or deferred server acquisitions and IT budget improvements, will drive an inflection point for the server market, with modest growth resuming in 2010.

While the improvement in IT expenditures will be modest in 2010, the recovery will not be the same for all segments and all geographies. For example, some emerging IT markets that were traditionally seen as areas of rapid growth for servers will be slower to rebound than originally expected. However, regions that were first affected by the recession, including the United States, are expected to show significant signs of improvement in 2010. Vendors will need to examine regional opportunities carefully, but they will be able to participate in opportunities related to IT infrastructure buildouts, particularly in emerging economies in which infrastructure is growing faster than in large slower-growth economies worldwide.

In the United States, IDC expects 9.6% unit growth, driven by an expected increase in volume servers (servers priced less than $25,000) in particular, a category that IDC expects to post 9.9% revenue growth in 2010.

IDC expects that the year 2010 will mark an important return to installed base refreshes driven by an uptick in IT budgets, new technological innovations, and a return to economic growth. IDC believes that pre-recessionary server life cycles for volume and midrange servers were consistently around three to five years in length. However, due to constrained IT budgets, IDC has observed replacement of these servers to be consistently pushed out throughout 2009 and into 2010. This has caused some segments of the installed base to become outdated, with some devices reaching five- to six-year life cycles.

Led by advances in microprocessor technology, the range of x86 server products will expand in 2010, and x86 chip technology will continue to dominate the server market through 2014 (see Figure 1). Given the greater range in performance capabilities, IDC expects a segmentation of the volume-driven x86 market, with microservers at the low end and scalable, multicore servers at the high end. This does not mean that the "meat and potatoes" or 2- to 4-socket, quad-core servers will disappear overnight. Instead, the new segments will be added below and above the high-volume 2- and 4-socket market segments. These twin opportunities at both ends of the computing spectrum (low and high) will allow vendors to innovate and to build new server-based solutions for the marketplace.

F i g u r e 1

Worldwide Server Customer Revenue by Chip Technology, 2002–2014
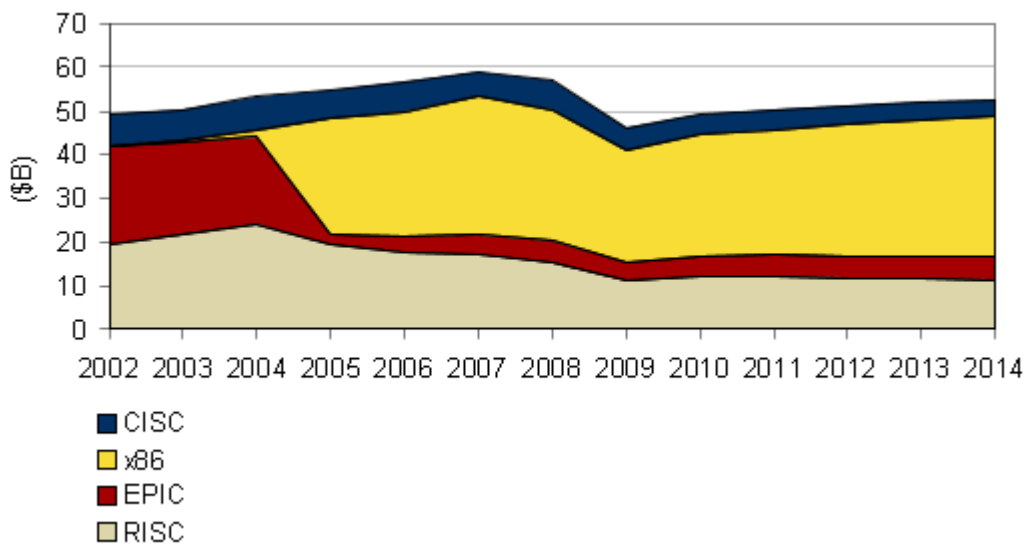
Source: IDC, 2010

Low-end x86 servers will run on small microprocessors, and they are designed to run light, simple workloads. These servers will live primarily in the megadatacenters of Web hosters and service providers. Their dense packaging addresses the need to pack as much computing power as possible into space-limited datacenters. At the high end will be x86 servers based on processors with 8–12 cores; these will run heavier workloads, such as scalable databases and enterprise applications, or support highly virtualized environments. Given the higher core count, it will be possible to run heavier enterprise workloads on 2-socket and 4-socket servers.

In addition, a new array of microservers, cloud-optimized servers, bladed appliances, and scalable systems will add more capabilities, in terms of performance, energy efficiency, packaging, and scalability, to the already standardized x86 server market. This will bring more capabilities to a wider audience of IT customers and businesses, and it will drive both innovation and price competitiveness in the marketplace.

IDC believes that this evolution in the market is a welcome one. Instead of deploying increasing amounts of x86 servers with little regard to what workload will run on them, end users and vendors alike will tailor their offerings to run specific solutions or "bundles" of software. These systems will be based on the end users' needs, driving the design for the technology's ability to meet those needs.

Rack-optimized servers are the largest segment of the worldwide server market by form factor, as well as the largest segment within the x86 server market. Often, rack-optimized servers account for the majority of servers in a customer's datacenter by units installed. Although some operational issues cropped up in recent years, regarding power/cooling expenses and efficient systems management, they have been largely addressed by systems vendors, working with ISVs to improve the efficiency of these servers. The use of multicore processors in recent years has also helped with cooling the servers because processing power was distributed among the cores; in older, single-core processors, heat output increased as the processor frequency was speeded up.

The term "rack optimized" refers to the ability of these servers to fit into industry-standard 19in. "racks." And, while blade server shipments are growing more rapidly than rack-optimized server shipments, IDC expects the rack-optimized units to account for the single largest "slice" of the overall server market worldwide in 2010. In 2009, rack-optimized servers accounted for nearly 60% of x86 server units shipped and for 60% of x86 server revenue. In contrast, blade servers accounted for 15% of x86 units shipped worldwide and for 20% of x86 server revenue.

The blade server segment has performed well during the recession. The "converged" nature of the platform and the high rate of virtualization seen on blade servers are two of the key factors that will drive further adoption in 2010. IT organizations are realizing that blade technologies can help optimize their IT environments by enabling them to keep pace with ever-changing business demands. This increased flexibility is seen as a major business benefit of deploying bladed servers.

IT managers will increasingly focus on total cost of ownership (TCO) as well as operational expenditures (opex). Cost-conscious companies have become sensitive to opex in addition to their capital expenditures (capex). The integrated nature of the bladed server platform benefits companies by simplifying their IT while improving asset utilization, IT flexibility, and energy efficiency. Additionally, IDC expects blades to gain traction with higher-end workloads as vendors

expand the capabilities of x86 server blades, adding reliability, availability, and serviceability (RAS) features that were traditionally seen on RISC and CISC systems. This enhanced RAS will allow IT organizations to break down the distinct IT silos often seen in their datacenter and computer rooms and to shift more of their business-critical and mission-critical applications into an all-in-one blade system.

Considerations

IDC believes that the fundamental characteristics of drivers for server hardware spending remain in place. As in the past, IDC expects that a combination of factors will drive change in the server market. New technology capabilities in both software and hardware are changing the way customers are using and purchasing server systems. As energy prices have climbed in many regions worldwide, and as utility grids have maxed out in some localities, power constraints have created a need for more energy-efficient power/cooling and a move to reduce the "thermal envelope" required to operate server systems within a datacenter. Space constraints within the datacenter have created a need for smaller form factors — and more efficient ones. Further, excess compute cycles on existing systems have created a drive to use existing resources more efficiently than ever before.

Conclusion

While the server market has suffered in the past few years, IDC expects a modest increase in server revenue for 2010. IDC believes the economic downturn will help to spur the trends toward multicore systems, blade platforms, and virtualization — all of which allow x86 servers to take on a greater variety of workloads and to do so very efficiently. Virtualization adoption is also expected to accelerate as customers use it not only for purposes of consolidating older servers but also as a viable tool for high availability (HA) and disaster recovery (DR) for x86 server deployments. Additionally, as users continue to do "more with less," the proliferation of more virtual machines (VMs) per physical system is expected to increase. As the number of VMs grows, and as more demanding enterprise applications move to x86 server systems, HA and DR planning will become more important than ever before.

Today, new multicore processors (with 2, 4, 6, 8, or more cores per processor) are providing increased performance while maintaining or reducing the power required and thus reducing the thermal envelope for computing. This combination of attributes has the effect of reducing both the capex and the opex of running workloads on multicore servers. IDC believes the advantages offered by these new processor products could drive some additional demand in 2010–2014, as many customers who held off purchases in 2009 return to the server marketplace to replace older systems and to refresh their server technology.

The confluence of processor, blade, and virtualization technologies entering the market — all at the same time in recent years — has changed the buying habits of a growing segment of the worldwide server market.