



## MARKET ANALYSIS

# Worldwide HPC Server 2015-2019 Forecast

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## IDC OPINION

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This document presents IDC's new forecast for the high-performance computing (HPC) server market. 2014 was a difficult year for the HPC server market with continued softness at the very high end combined with a major vendor change. 2013 started the high-end slowdown, after three years of record-breaking growth. 2014 was basically flat with 2013 at \$10.2 billion in worldwide revenue. In this update, we are adjusting our forecasts in a major way, starting with no growth in 2014 and then a CAGR of 8.2% from 2014 to 2019. The global economic turmoil that hit technical computing hard, starting in late 2008, was reversed by a strong 2009-2012 performance. In 2012, worldwide factory revenue for the high-performance computing server market increased by 7.7% year over year to reach a record \$11.1 billion, up from \$10.3 billion in 2011. Then, in 2013, the high end of the market slowed down and saw a decline in both 2013 and 2014. However, outside the very high end (the top 10 system sales), the HPC market showed healthy growth in 2013 and 2014, but it was not enough to make up for the high-end slowdown. This new IDC HPC forecast still predicts healthy overall worldwide long-term annual revenue growth of 8.2% (CAGR) out to 2019, and 6.9% annual growth in HPC system units shipped. Note that HPC units shipped are projected to grow more slowly due to the increase in average system purchase prices. All four competitive segments are projected to show growth starting in 2015. In this IDC document, we present our latest five-year forecast for the HPC server space covering the 2015-2019 period. This forecast update covers:

- A brief overview of the market
- Detailed assumptions for our five-year forecast
- New forecasts for technical computing server revenue, unit shipments, and average selling prices for each of the four competitive segments that IDC tracks
- IDC's guidance for vendors

## IN THIS STUDY

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This IDC study presents an overview of IDC's forecast for the HPC server market for the 2015-2019 period. The data in this study is based on IDC's segmentation of the technical market, which is as follows:

- **Supercomputers.** Systems purchased to support technical applications and sold for \$500,000+
- **Technical divisional servers.** Systems purchased to support technical applications and sold for \$250,000 to \$499,999
- **Technical departmental servers.** Systems purchased to support technical applications and sold for \$100,000 to \$249,999
- **Technical workgroup servers.** Systems purchased to support technical applications and sold for <\$100,000

## Methodology

The forecasts in this study are based on a number of information sources, including IDC's technical computing systems quarterly census database, vendor results for the historical years, discussions with vendors and users on future business directions and expectations, end-user studies, and in-depth interviews with users.

The forecasts were developed based on IDC's technical computing systems forecast model, which targets compute servers. This model initially considers competitive segments (supercomputers, technical divisional servers, technical departmental servers, and technical workgroup servers), forecasting system unit shipments, revenue, and average sales price (ASP) by industry/application segment. The forecasts include estimates for second-tier and new-entrant vendors selling into the HPC server market space.

The forecasts provided in this study include only server systems used in technical applications. Systems sold into commercial (nontechnical) applications and desktop technical computers are not included in this study.

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

## SITUATION OVERVIEW

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The overall HPC server market recently suffered two consecutive years of decline in 2013 and 2014 due to a slowdown at the very high end of the market combined with the split up of IBM x86 servers to Lenovo. For 2015, IDC is projecting an increase of around 5%. IDC is also projecting a CAGR of 8.2% from 2015 to 2019.

## FUTURE OUTLOOK

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### Forecast and Assumptions

Table 1 summarizes the top 3 major assumptions that directly impact this forecast. HPC today is not as insulated as it used to be from the macroeconomic conditions due to the cluster penetration and the resulting downstream adoption of commodity technologies. While government labs and universities remain as the major users of HPC, clusters built on commodity components have helped expand HPC

adoption significantly since 2003. Today, HPC has become indispensable for many industrial organizations to stay competitive. The broadening of the user base also makes the HPC server market more prone to macroeconomic changes and, therefore, more prone to resemble the dynamics of the general server market.

Starting in 2009 and continuing to 2012, there was a major shift in the market toward larger systems with supercomputers showing the strongest growth. The lower end of the HPC server market started to show growth in 2013, but it still hasn't recovered from the previous high points.

The positive market results for 2009-2012 in HPC demonstrate three successive years of growth, indicating that the HPC server market has emerged from the recession, and overall HPC spending is back to a healthy growth mode. Unfortunately, 2013 and 2014 reversed this growth trend. Table 2 presents our major assumptions behind the forecast.

We expect the government, homeland security, and academic space to remain bright spots during the forecast period. Those sectors usually get their procurement funding from the government; therefore, their purchasing behavior is somewhat different from that of other sectors. Generally speaking, these sectors are less impacted by changes in the economic climate compared with other sectors. We expect that supercomputers and very large supercomputers will continue as the bright spots over the next five years. As the petascale/exascale race around the world becomes fiercer, we expect to see more nations announcing their petascale/exascale plans and more such systems being rolled out in the forecast period. Over the next few years, we anticipate that nations will invest significantly in software and applications that can efficiently utilize the petascale HPC systems.

Among the entire industrial sector, IDC anticipates the oil/gas, finance, and DCC/gaming segments to grow at a very healthy rate from 2015 to 2019. As the global economy grows, the demand for oil will also pick up, which in turn will drive up sales for HPC systems that can run large-scale seismic analysis and reservoir simulations. On the DCC side, we are seeing an increased demand for systems capable of running large-scale, sophisticated games as well as 3D movies. For the rest of the industrial sectors, IDC expects increased spending in HPC at a more moderate rate (i.e., the growth rate in those sectors will be close to that for other IT spending, as companies slowly resume their discretionary budget).

**TABLE 1**

**Top 3 Assumptions for the Worldwide HPC Server Market, 2015-2019**

Market Force	IDC Assumption	Significance	Changes to This Assumption That Could Affect Current Forecast	Comments
High-end slowdown	The very high end of the HPC server market has stalled for almost two years, after a major growth cycle. IDC expects that 2015 will not have major surprises, and so 2015 will be slightly higher than 2014. Growth at the high end in 2015 will depend on the global exascale race and loosening of government HPC budgets in a time of overall slow economic growth. High-end HPC server revenue is also paced by the timing of new generations of base processors (CPUs).	The high end of the HPC technical server market has been the growth driver since 2009, and the impact of the change in the top 10, or even the top 5, systems has a major impact on the overall market growth rates. In 2012, the top 5 HPC sales represented over 10% of HPC server revenue. The gap between users anticipating exascale performance and what most mainstream HPCs users seek may widen, creating a disconnect between the two sectors.	IDC is expecting more softness at the high end for at least six months and possibly another full year.	This is a top driver of the HPC server market growth rate. While the lower 90% of the HPC market is back to a moderate growth rate, the very large sales continue to have a major impact. High-end HPC developers will need to address new application areas — especially HPDA — to meet the changing demands of both public and private users.

**TABLE 1**

**Top 3 Assumptions for the Worldwide HPC Server Market, 2015-2019**

Market Force	IDC Assumption	Significance	Changes to This Assumption That Could Affect Current Forecast	Comments
Vendor transition	The sale of IBM's x86 server business to Lenovo has caused some IBM clients to delay purchases, while the uncertainty about the ability of government agencies in the United States and a few other nations to purchase high-end x86 servers from Lenovo remains unresolved. In addition, the global competition for the IBM installed base has delayed purchases. These issues should settle down by mid-2015, but by then, multiple vendors will capture some business from IBM and accounts intended for Lenovo. Another important factor is vendor Intel "moving up the food chain" to compete in the market for interconnect fabrics and perhaps beyond. Intel has already assumed a more prominent role in multiple large HPC system procurements.	The IBM-Lenovo deal caused major purchase delays in 2014, helping to slow the overall HPC server market in 2014. It may cause a sales spike in 1Q15 or 2Q15 as buyers' purchases catch up with the delays. Intel's expanding role is already being felt in the HPC marketplace and is likely to assume high significance during the forecast period.	China's Lenovo and a growing host of Taiwanese and Chinese white-box suppliers could create significant turmoil in the overall server market (not just HPC) by driving down margins for the established primarily U.S. server supplier base, ultimately restricting the U.S. suppliers' ability to offer servers designed to compete at the highest level of performance.	IDC expects that the global HPC server market landscape will be transformed over the next three to five years, with notable gains coming from both foreign-branded and white-box vendors as well as a shuffling of market share within the U.S. vendor pool.
HPC leadership	The European Commission adopted an ambitious plan to double HPC funding through 2020, but the extent to which the plan is realized	Competition in the global high-end HPC server market continues to heat up, especially as the race moves away from primarily hardware	A top high-end HPC system can cost well over \$100 million and in one case more than \$500 million. The deployment or non-deployment of one or	We expect that more countries will enter the race for HPC leadership, and this could create a number of new players at the very high end of the

**TABLE 1**

**Top 3 Assumptions for the Worldwide HPC Server Market, 2015-2019**

Market Force	IDC Assumption	Significance	Changes to This Assumption That Could Affect Current Forecast	Comments
	remains to be seen. China is becoming a much larger player in both having a top HPC vendor and becoming a major purchaser of large HPC servers. Lenovo could capture a significant share of the HPC server market in China in the next few years, bolstering China's efforts to become a commercial HPC powerhouse. The United States is still the largest market for HPC servers, but its high-end plans are uncertain. Russia and India announced plans for increasing funding for HPC, but they may be too strapped for cash to realize the vision. The wild card is how the United States will respond to this increased competition.	capabilities to innovative system design and associated software for a growing HPC and HPDA application base. The supercomputer segment took a step back in 2013 after the major growth spurt in preceding years. In 2013, supercomputers accounted for slightly less than half of all HPC server revenue.	two of these systems can significantly impact the yearly market. However, leadership at the highest end of HPC does not necessarily transfer to the HPC sector writ large.	HPC server market. It is unclear if this will drive additional growth in the high end or simply present the same size pie to a growing number of suppliers. Ultimately, the race to exascale and beyond will be determined as much by the ability and willingness of competing nations to spend money as by technology advances. This in turn will depend on how vital nations see HPC for their scientific and economic standing.

Source: IDC, 2015

**TABLE 2**

**Key Forecast Assumptions for the Worldwide HPC Server Market, 2015-2019**

Market Force	IDC Assumption	Impact	Accelerator/ Inhibitor/ Neutral	Certainty of Assumption
<b>Top 3</b>				

TABLE 2

Key Forecast Assumptions for the Worldwide HPC Server Market, 2015-2019

Market Force	IDC Assumption	Impact	Accelerator/ Inhibitor/ Neutral	Certainty of Assumption
<b>assumptions</b>				
High-end slowdown	The very high end of the HPC server market has stalled for almost two years, after a major growth cycle. IDC expects that 2015 will not have major surprises, and so 2015 will be slightly higher than 2014. Growth at the high end in 2015 will depend on the global exascale race and loosening of government HPC budgets in a time of overall slow economic growth. High-end HPC server revenue is also paced by the timing of new generations of base processors (CPUs).	<b>High.</b> The high end of the HPC server market has been the growth driver since 2009, and the impact of the change in the top 10, or even the top 5, systems has a major impact on the overall market growth rates. In 2012, the top 5 HPC sales represented over 10% of HPC server revenue. The gap between users anticipating exascale performance and what most mainstream HPCs users seek may widen, creating a disconnect between the two sectors.	↓	★★★★★
Vendor transition	The sale of IBM's x86 server business to Lenovo has caused some IBM clients to delay purchases, while the uncertainty about the ability of government agencies in the United States and a few other nations to purchase high-end x86 servers from Lenovo remains unresolved. In addition, the global competition for the IBM installed base has delayed purchases. These issues should settle down by mid-2015, but by then, multiple vendors will capture some business from IBM and accounts intended for Lenovo. Another important factor is vendor Intel "moving up the food chain" to compete in the market for interconnect fabrics and perhaps beyond. Intel has already assumed a more prominent role in multiple large HPC system procurements.	<b>High.</b> The IBM-Lenovo deal caused major purchase delays in 2014, helping to slow the overall HPC server market in 2014. It may cause a sales spike in 1Q15 or 2Q15 as buyers' purchases catch up with the delays. Intel's expanding role is already being felt in the HPC marketplace and is likely to assume high significance during the forecast period.	↓	★★★★★

**TABLE 2**

**Key Forecast Assumptions for the Worldwide HPC Server Market, 2015-2019**

Market Force	IDC Assumption	Impact	Accelerator/ Inhibitor/ Neutral	Certainty of Assumption
HPC leadership	The European Commission adopted an ambitious plan to double HPC funding through 2020, but the extent to which the plan is realized remains to be seen. China is becoming a much larger player in both having a top HPC vendor and becoming a major purchaser of large HPC servers. Lenovo could capture a significant share of the HPC server market in China in the next few years, bolstering China's efforts to become a commercial HPC powerhouse. The United States is still the largest market for HPC servers, but its high-end plans are uncertain. Russia and India announced plans for increasing funding for HPC, but they may be too strapped for cash to realize the vision. The wild card is how the United States will respond to this increased competition.	<b>High.</b> Competition in the global high-end HPC server market continues to heat up, especially as the race moves away from primarily hardware capabilities to innovative system design and associated software for a growing HPC and HPDA application base. The supercomputer segment took a step back in 2013 after the major growth spurt in preceding years. In 2013, supercomputers accounted for slightly less than half of all HPC server revenue.	↑	★★★★★
<b>Overall HPC market trends</b>				
Economic impacts on HPC	The recovery of the global economy will continue to have a positive impact on overall IT markets, IT server spending, and HPC server spending.	<b>High.</b> HPC server sales will continue to grow following the decline in 2013, after the positive momentum in 2010, 2011, and 2012. Pent-up demand at the low end should fuel growth as the global economy rebounds. IDC forecasts growth through 2019 for all HPC competitive segments.	↑	★★★★☆



**TABLE 2**

**Key Forecast Assumptions for the Worldwide HPC Server Market, 2015-2019**

Market Force	IDC Assumption	Impact	Accelerator/ Inhibitor/ Neutral	Certainty of Assumption
High-end HPC supercomputer sector	Funding will likely increase for large-scale HPC procurements from 2016 to 2019. 2012 was an exceptionally strong year for the supercomputer sector, but year-over-year growth of nearly 30% is unsustainable, as shown by the recent slowdown. We believe that the supercomputer segment will continue to grow at a robust, more moderate rate.	<b>Moderate.</b> This "lumpy" segment will remain subject to major swings on a quarter-to-quarter basis due to the relatively small number of large transactions that occur in this segment. Annual swings can also happen, especially if one or more anticipated fourth-quarter large sales slip into the following year or conversely if one or more large sales accepts in the fourth quarter instead of the following first quarter.	↑	★★★★☆
Mainstream midrange HPC market	The midrange HPC market revenue profile will see healthy growth in the forecast period as macroeconomic conditions improve.	<b>High.</b> 1Q13 showed the first sign of strong recovery with a healthy increase in HPC server spending. Both 2013 and 2014 results increased our belief that midrange HPC is back on a growth track.	↑	★★★★☆
Mainstream low-end HPC market	The low-end HPC market resumed revenue growth in 2013. During the forecast period, as the macroeconomic condition improves, discretionary budgets will slowly come back and the low-end market will expand again at a healthy rate.	<b>High.</b> We expect CAGR during the forecast period to be near 10% as the improving economy taps demand pent up during the most difficult period of the recession.	↑	★★★★☆
<b>HPC technology trends</b>				
Petascale/exascale initiatives	Petascale/exascale initiatives around the world will continue to increase momentum in IDC's supercomputer segment. Despite the current uncertainty surrounding exascale development in the United States, IDC expects the United States to compete strongly with European and Asian exascale initiatives.	<b>High.</b> A number of nations are in the race to develop petascale and exascale systems, some of which already cost \$100 million per system. This will stimulate global revenue expenditures at the high end of the HPC market.	↑	★★★★☆

**TABLE 2**

**Key Forecast Assumptions for the Worldwide HPC Server Market, 2015-2019**

Market Force	IDC Assumption	Impact	Accelerator/ Inhibitor/ Neutral	Certainty of Assumption
Coprocessors	IDC expects x86 base processors to remain dominant during this period. Coprocessors and accelerators, especially NVIDIA GPGPUs and Intel Xeon Phi, will see increased traction in the 2014-2016 period. Low-power processors, such as ARM and Atom, will begin finding their place in the HPC ecosystem. The OpenPower Foundation is starting to gain some market presence as well.	<b>High.</b> Coprocessors and accelerators are rapidly gaining momentum in the HPC community today, and the mainstream adoption is largely dependent on the programming models and application readiness. In addition, ISV support will be critical for the growth potential of these components in the overall HPC sector.	↑	★★★★★
High-performance data analysis (Big Data needing HPC)	Data-intensive computing has long been a part of HPC, but newer analytical methods using Hadoop and other methods (e.g., graph analytics) will grow the Big Data market in HPC (i.e., the HPDA market). In addition, the data explosion in HPC will drive larger system and storage purchases. In the long term, HPDA will shift HPC architectures away from their current extreme compute centricism. There is some uncertainty as to how much of these new applications will be run in cloud-based datacenters.	<b>High.</b> We expect most buyers to purchase the same systems for traditional HPC and newer Big Data uses, but the new methods will increase average system sizes. However, a new wave of commercial firms are adopting HPC to tackle fraud and other daunting analytics challenges. Over a longer period, HPC in the cloud could significantly alter the trajectory of this sector, should it prove to be technically capable and economically justifiable.	↑	★★★★☆

Legend: ★☆☆☆☆ very low, ★★☆☆☆ low, ★★★☆☆ moderate, ★★★★☆ high, ★★★★★ very high

Source: IDC, 2015

### ***Worldwide Overall HPC Server Market Forecasts***

As shown in Table 3 and Figures 1-3, IDC expects that, over the next five years (2015-2019), the total HPC server market will expand at a CAGR of 8.2% in revenue to reach \$15.2 billion by 2019. System unit shipments are projected to grow at 6.9% annually to a total of 186,418 system units by 2019. Note that the new growth rates are higher than the growth rates of last year due to the lower starting point for 2014. IDC still expects that HPC server growth will be helped by the continuing "petascale/exascale race" for high-end leadership.

**TABLE 3**

**Worldwide HPC Server Revenue, Shipments, and Average Selling Price, 2009-2019**

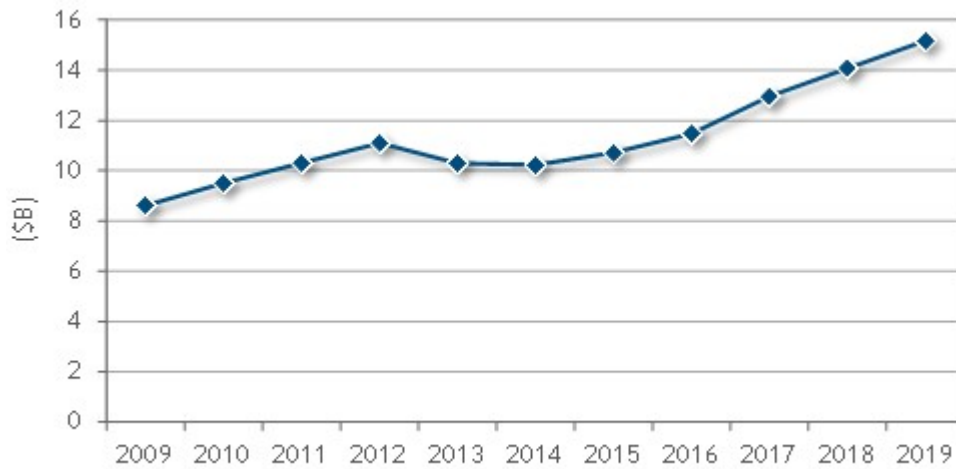
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2013–2014 Growth (%)	2014–2019 CAGR (%)
Revenue (\$M)	8,614.1	9,498.3	10,300.1	11,097.7	10,298.8	10,222.3	10,718.2	11,466.9	12,957.6	14,073.2	15,164.6	-0.7	8.2
Shipments	105,054	119,844	111,553	104,148	123,982	133,392	143,643	153,483	165,498	176,385	186,418	7.6	6.9
ASP (\$000)	82	79	92	107	83	77	75	75	78	80	81	-7.7	1.2

Note: See Table 1 for top 3 assumptions and Table 2 for key forecast assumptions.

Source: IDC, 2015

**FIGURE 1**

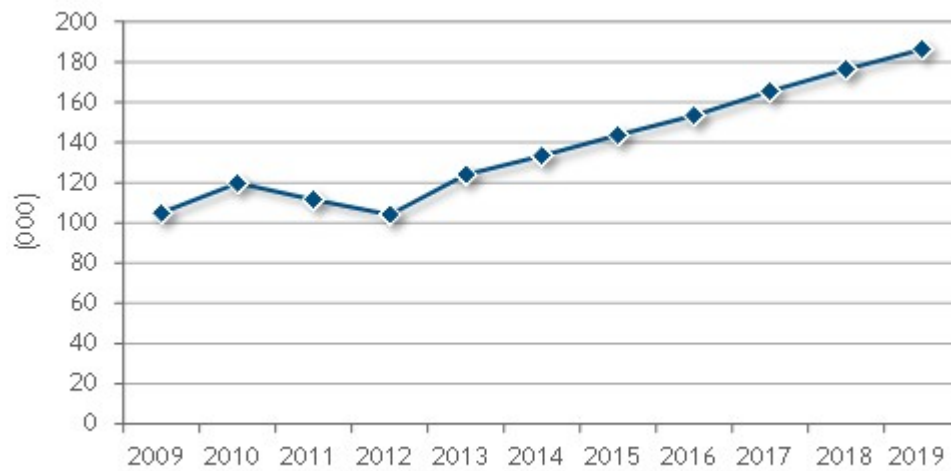
**Worldwide HPC Server Revenue, 2009-2019**



Source: IDC, 2015

**FIGURE 2**

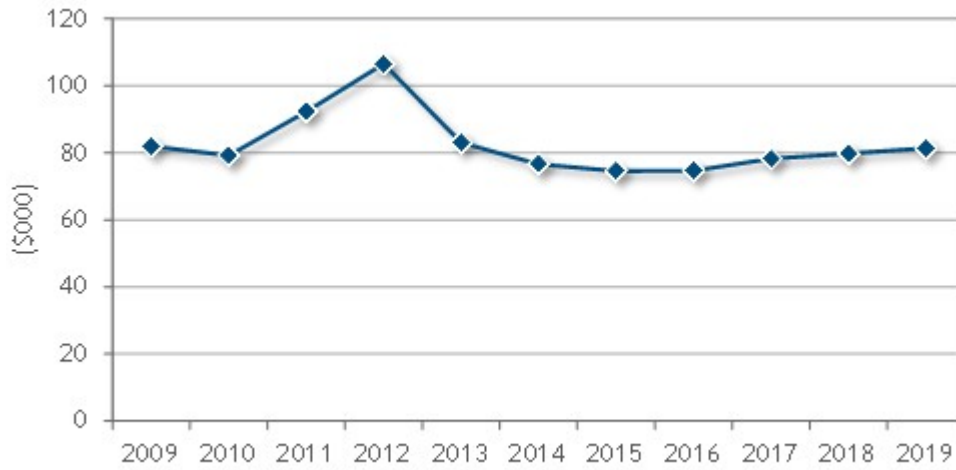
**Worldwide HPC Server Shipments, 2009-2019**



Source: IDC, 2015

**FIGURE 3**

**Worldwide HPC Server Average Selling Price, 2009-2019**



Source: IDC, 2015

### ***Forecasts by Competitive Segments***

Tables 4-6 present HPC revenue, shipment, and ASP forecasts by the four competitive segments. From a competitive segment perspective, we expect to see the highest growth in the supercomputer segment with a CAGR of 9.8%. Supercomputer growth will be followed closely by the workgroup segment, where we project a CAGR of 8.4% for the next five years (due to its continued recovery from dropping so much since the 2008 recession). The divisional segment is projected to grow at a 7.2% rate, and the departmental segment is projected to grow at a 7.1% rate out to 2019.

**TABLE 4****Worldwide HPC Server Revenue by Competitive Segment, 2009-2019 (\$M)**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2013–2014 Growth (%)	2014–2019 CAGR (%)
Supercomputer	3,342.1	3,475.6	4,370.2	5,655.0	3,994.7	3,149.5	3,098.1	3,266.6	4,213.5	4,692.1	5,034.2	-21.2	9.8
Divisional	1,078.6	1,268.7	1,236.7	1,216.2	1,355.1	1,524.2	1,608.7	1,714.1	1,819.6	2,062.0	2,155.5	12.5	7.2
Departmental	2,882.7	3,342.7	3,467.3	2,979.2	3,363.3	3,830.9	4,130.5	4,437.0	4,736.1	4,961.0	5,406.2	13.9	7.1
Workgroup	1,310.8	1,411.3	1,225.9	1,247.4	1,585.7	1,717.7	1,881.0	2,049.2	2,188.3	2,358.1	2,568.6	8.3	8.4
<b>Total</b>	<b>8,614.1</b>	<b>9,498.3</b>	<b>10,300.1</b>	<b>11,097.7</b>	<b>10,298.8</b>	<b>10,222.3</b>	<b>10,718.2</b>	<b>11,466.9</b>	<b>12,957.6</b>	<b>14,073.2</b>	<b>15,164.6</b>	<b>-0.7</b>	<b>8.2</b>

Note: See Table 1 for top 3 assumptions and Table 2 for key forecast assumptions.

Source: IDC, 2015

**TABLE 5****Worldwide HPC Server Shipments by Competitive Segment, 2009-2019**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2013–2014 Growth (%)	2014–2019 CAGR (%)
Supercomputer	2,067	2,560	2,908	2,400	1,484	1,383	1,455	1,498	1,533	1,547	1,600	-6.8	3.0
Divisional	3,596	3,914	3,724	3,663	4,271	4,788	5,150	5,539	5,958	6,221	6,409	12.1	6.0
Departmental	17,963	20,382	20,624	16,981	20,246	22,378	24,029	25,803	27,707	28,596	29,752	10.5	5.9
Workgroup	81,428	92,988	84,294	81,104	97,981	104,843	113,009	120,642	130,300	140,021	148,657	7.0	7.2
<b>Total</b>	<b>105,054</b>	<b>119,844</b>	<b>111,550</b>	<b>104,148</b>	<b>123,982</b>	<b>133,392</b>	<b>143,643</b>	<b>153,483</b>	<b>165,498</b>	<b>176,385</b>	<b>186,418</b>	<b>7.6</b>	<b>6.9</b>

Note: See Table 1 for top 3 assumptions and Table 2 for key forecast assumptions.

Source: IDC, 2015

**TABLE 6****Worldwide HPC Server Average Selling Price by Competitive Segment, 2009-2019 (\$000)**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2018	2013–2014 Growth (%)	2014–2019 CAGR (%)
Supercomputer	1,617	1,358	1,503	2,356	2,691	2,277	2,130	2,180	2,749	3,033	3,145	-15.4	6.7
Divisional	300	324	332	332	317	318	312	309	305	331	336	0.3	1.1
Departmental	160	164	168	175	166	171	172	172	171	173	182	3.1	1.2
Workgroup	16	15	15	15	16	16	17	17	17	17	17	1.2	1.1
Total	82	79	92	107	83	77	75	75	78	80	81	-7.7	1.2

Note: See Table 1 for top 3 assumptions and Table 2 for key forecast assumptions.

Source: IDC, 2015



### **Supercomputer Segment (ASP \$500,000+)**

The supercomputer segment is driving very broad swings in the overall HPC server market these days. It showed strong growth in 2012 at 29.4%, resulting in \$5.7 billion in revenue. It was also very strong in 2011 with over 25% growth, resulting in \$4.4 billion in revenue. However, things changed in 2013 and 2014, resulting in declines in both years. Looking toward the future to 2019, we project a CAGR of 9.8% for the supercomputer segment for the next five years, and total revenue in this segment is projected to reach \$5 billion by 2019. We expect more petascale or near-petascale systems to be built and deployed in the forecast period, and some derivative smaller systems based on the same technologies used on petascale computers will also be rolled out in the outer years. The major area to watch is how many new top 10 systems are installed each year and at what price – this could be the driving factor for the overall market growth rates in many years.

### **Divisional Segment (ASP \$250,000-499,999)**

The divisional segment will also see growth over the forecast period. We expect this segment to expand at a CAGR of 7.2% in revenue for the 2015-2019 period. This segment suffered a 23% decline in 2009 compared with 2008, mainly caused by the reduction of discretionary budget at many organizations during the economic crisis. As the economy recovered in 2010, the segment reached \$1.3 billion and went up and down through 2013. We expect that it will exceed \$2 billion in server revenue by 2019.

### **Departmental Segment (ASP \$100,000-249,999)**

The departmental segment used to be the largest revenue contributor to HPC prior to 2009, then the economy downturn changed that dynamic. In 2009, supercomputers – the high-end segment in HPC – generated the most revenue, and the departmental segment was rendered to second place. Revenue in the departmental segment reached \$3.5 billion in 2011. In 2012, the departmental segment experienced a 14% decline, resulting in \$3 billion in revenue, and then it started growing well in 2013. In 2014, it reached \$3.8 billion. In the forecast period, we expect that the departmental segment will pick up at a relatively strong rate as companies resume their discretionary spending. We expect a CAGR for revenue of 7.1% from 2015 to 2019.

### **Workgroup Segment (ASP <\$100,000)**

In 2009, the workgroup segment suffered the most among all of the four segments that IDC tracks, with a revenue loss of 33% compared with 2008. 2011 showed a major decline of 13%, resulting in \$1.2 billion in workgroup HPC server sales. In 2012, the workgroup segment grew by 2% with revenue of \$1.3 billion. For 2014, the workgroup segment reached \$1.7 billion. As the low end of the market, this segment will often closely follow discretionary budget trends within an organization. We expect workgroup segment revenue to grow at a stronger CAGR of 8.4% from 2015 to 2019.

## **Market Context**

Table 7 and Figure 4 compare the previous IDC HPC server market forecast (see *Worldwide Technical Computing Server 2014-2018 Forecast*, IDC #248779, May 2014) with this new five-year forecast. The new forecast represents a decrease from IDC's May 2014 forecast for all five years, starting in 2014. This decrease is based on the impact of the slowdown at the very high end, combined with the IBM-Lenovo transition.

**TABLE 7**

**Worldwide HPC Server Revenue 2009-2019: Comparison of May 2014 and March 2015 Forecasts (\$M)**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
March 2015 forecast	8,614.1	9,498.3	10,300.1	11,097.7	10,298.8	10,222.3	10,718.2	11,466.9	12,957.6	14,073.2	15,164.6
May 2014 forecast	8,614.1	9,498.3	10,300.1	11,097.7	10,298.8	11,181.0	12,063.1	12,945.3	13,827.5	14,709.7	NA

Notes:

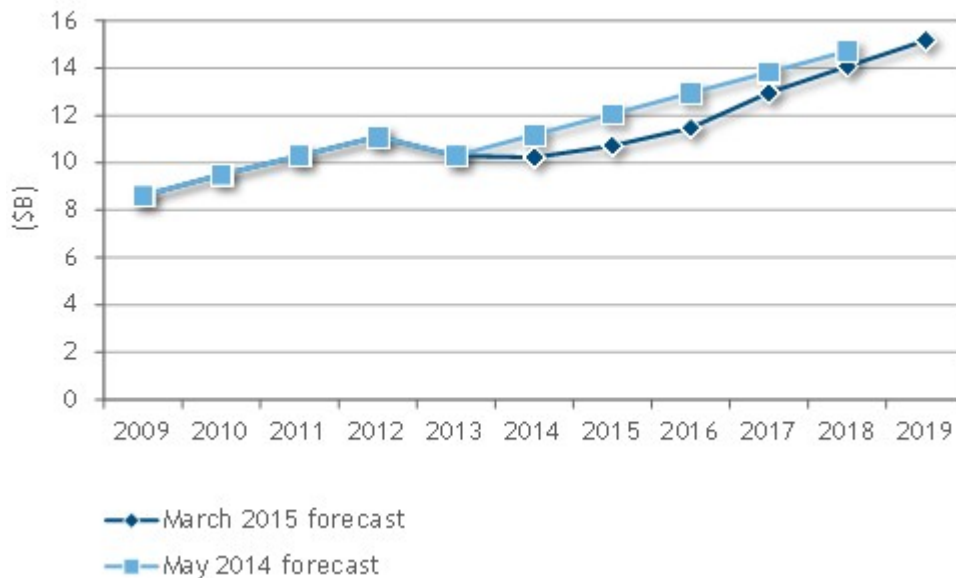
See *Worldwide Technical Computing Server 2014-2018 Forecast* (IDC #248779, May 2014) for prior forecast.

Historical market values presented here are as published in prior IDC documents based on the market taxonomies and current U.S. dollar exchange rates existing at the time the data was originally published. For more details, see the Methodology in the Learn More section.

Source: IDC, 2015

**FIGURE 4**

**Worldwide HPC Server Revenue 2009-2019: Comparison of May 2014 and March 2015 Forecasts**



Source: IDC, 2015

## ESSENTIAL GUIDANCE

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After three consecutive years of healthy growth (2009-2012), HPC saw a two-year slowdown (2013-2014), primarily driven by the slowdown at the very high end, combined with the IBM-Lenovo transition. With the changing market dynamics in many different areas, we advise vendors to consider the following:

- Carefully select target markets, and then focus on developing differentiated solutions and services for your targeted segments (e.g., Big Data combined with big compute, industry-focused solutions, and petascale software solutions).
- Recognize that HPC ecosystem complexity and capability are increasing due to accelerators and coprocessors, new types of storage like flash, and new I/O and interconnects, among other factors. Vendors will need to focus on developing scalable heterogeneous solutions to address different workloads requirements.
- Look into new ways to offer HPC solutions. Now more than ever, users are rethinking ways to acquire HPC capabilities. Those considerations then become the driver for the development of new ways of delivering HPC such as cloud computing, utility computing, and computing cycle leasing models. We advise vendors that are interested in this space to pay close attention to the evolving user requirements, particularly their HPC workloads requirements and design solutions that directly address these needs (e.g., finding ways to adapt existing HPC applications to perform well in clouds and make cloud offerings more HPC friendly).
- Look at expansion into new geographic regions such as China, broader Asia, and the other BRICs, but spend time studying the unique market dynamics in these regions before committing resources.

## LEARN MORE

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### Related Research

Additional research from IDC in the technical computing hardware program includes the following documents:

- *Experiences with Accelerators and Coprocessors in High-Performance Computing: HPC User Forum, September 15-17, 2014, Seattle, Washington* (IDC #251973, October 2014)
- *Major Global High-Performance Computing Initiatives: HPC User Forum, September 15-17, 2014, Seattle, Washington* (IDC #251971, October 2014)
- *Lenovo Completes Acquisition of IBM's x86 Server Business* (IDC #lcUS25176214, September 2014)
- *Worldwide Broader HPC 2014-2018 Forecast: Servers, Storage, Software, Middleware, and Services* (IDC #248835, June 2014)
- *Worldwide Technical Computing Server 2014-2018 Forecast* (IDC #248779, May 2014)
- *Global HPC Market Dynamics in 2013* (IDC #248137, April 2014)
- *Worldwide HPC Public Cloud Computing 2014-2017 Forecast* (IDC #247846, April 2014)
- *Summary of IDC's 2014 Research in the Use of HPC by Oil and Gas Organizations* (IDC #247704, March 2014)
- *IBM Sale to Lenovo Opens Opportunity for Other HPC Vendors* (IDC #lcUS24694314, February 2014)

- *IDC's Worldwide High-Performance Computing Predictions 2014* (IDC #WC20140211, February 2014)
- *Market Analysis Perspective: Worldwide HPC, 2013 – Directions, Trends, and Customer Requirements* (IDC #244742, December 2013)
- *HPDA Pulse Results: 2013 Hardware and Storage Market Analysis* (IDC #244493, November 2013)
- *HP FY13: Revenue Declines Abate on Stronger Core Business* (IDC #lcUS24466413, November 2013)
- *China Eyes 10,000-Fold Data Reduction for Internet of Things* (IDC #lcUS24392513, October 2013)
- *National and International Initiatives: HPC User Forum, September 2013, Boston, Massachusetts* (IDC #243776, October 2013)
- *High-Performance Data Analysis in the Life Sciences: HPC User Forum, September 2013, Boston, Massachusetts* (IDC #243774, October 2013)
- *Chinese Research in Processor Designs for High-Performance Computing and Other Uses* (IDC #243502, October 2013)
- *The Broader HPC Market 2012-2017 Forecast: Servers, Storage, Software, Middleware, and Services* (IDC #242742, August 2013)
- *IDC's Worldwide Technical Server Taxonomy, 2013* (IDC #242725, August 2013)
- *China Regains Top Supercomputer Title* (IDC #lcUS24190613, June 2013)
- *Worldwide High-Performance Data Analysis 2013-2017 Forecast* (IDC #241315, June 2013)
- *Top Issues for HPC Sites: HPC User Forum, April 29-May 1, 2013, Tucson, Arizona* (IDC #241463, June 2013)

## Methodology

### *Historical Market Values and Exchange Rates*

Historical market values presented here are as published in prior IDC documents based on the market taxonomies and current U.S. dollar exchange rates existing at the time the data was originally published. For markets other than the United States, these as-published values are therefore based on a different exchange rate each year.

Please refer to IDC's regional research studies containing historical forecasts for multiple countries for more accurate regional growth in local currencies. Note that this discussion applies only to historical values prior to 2014. 2014 and all future years are forecast at a constant exchange rate.

## Synopsis

This IDC study presents an overview of IDC's forecast for the HPC market for the 2015-2019 period. The data in this study is based on IDC's segmentation of the technical market, which is as follows:

- **Supercomputers.** Systems purchased to support technical applications and sold for \$500,000+
- **Technical divisional servers.** Systems purchased to support technical applications and sold for \$250,000 to \$499,999
- **Technical departmental servers.** Systems purchased to support technical applications and sold for \$100,000 to \$249,999

- **Technical workgroup.** Systems purchased to support technical applications and sold for <\$100,000

2010, 2011, and 2012 were strong recovery years for the HPC server market with 10.3%, 8.4%, and 7.7% year-on-year growth rates, respectively. Then 2013 and 2014 showed a market slowdown.

According to Earl Joseph, IDC HPC program vice president, "We are now forecasting a five-year 8.2% CAGR, after seeing 2014 come in as a no-growth year, and expect the HPC server market to reach \$15 billion by 2019."

## 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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