Market Analysis

Global HPC Market Dynamics in 2013

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IDC OPINION

Worldwide factory revenue for the high-performance computing (HPC) technical server market declined by 7.2% in full year 2013 to reach $10.3 billion, down from $11.1 billion in 2012, according to the newly released International Data Corporation (IDC) Worldwide High-Performance Technical Server QView. IDC's Worldwide High-Performance Technical Server QView provides numerical results on the worldwide sales into the technical computing market, with details on the purchases by competitive segment, region, processor type, and more. The QView also enables creation of accurate predictive models of market trends, customer spending, and market impacts. Findings include:

- While 2013 results show a decline in HPC technical server market revenue, this is not indicative of a broader trend but rather a onetime correction from record highs in 2012, which was an exceptional year. IDC had predicted the decline in revenue from 2012, when several extremely large supercomputer sales propelled the high-end supercomputer segment of the market to new heights.
- IDC expects the worldwide HPC server market to enjoy a healthy compound annual growth rate (CAGR) of 7.3% over the 2014–2017 forecast period, with revenue exceeding $14 billion in 2017.

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IN THIS STUDY

For more than 25 years, IDC has been tracking worldwide HPC server revenue based on detailed quarterly supply-side reporting of vendors' factory shipments. IDC's aim has been to track every HPC-bound server system coming out of a vendor's or subcontractor's manufacturing facility and to characterize each system across a large number of attributes related to actual (street) pricing, component technologies, intended usage, and other characteristics of interest to IDC clients.

Methodology

Each quarter, IDC analysts conduct interviews with major hardware original equipment manufacturers (OEMs) in the technical computing space to gather information on each vendor's quarterly sales. In addition, IDC conducts a large number of surveys of end buyers to supplement and validate the information from vendors. Specifically, IDC collects data on the number of HPC systems sold, system revenue, a system's average selling price (ASP), the competitive segment that a system falls into, architecture of the system, average number of processor package per system, average number of nodes for each system sold, system revenue distribution by geographical regions, and system revenue distribution by operating systems.

IDC records all of the previously mentioned information and merges it into a master database, which contains over 50 data fields; some of these fields contain actual data gathered from the OEMs as described previously, some are calculated based on the actual data, and some are only used for special data cuts.

IDC then creates a pivot table based on this master database. Data tables with different views of the technical computing market can then be created from this pivot table. IDC refers to this data structure as the "HPC QView." In addition to the HPC QView, IDC maintains other HPC technical computing data structures such as:

- HPC end-user demand-side data structure
- HPC application/industry segmentation data structure
- HPC country-level data structure
- HPC broader market data structures, which include storage, interconnects, system software, application software, and services

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

SITUATION OVERVIEW

Definitions of the HPC Market Categories

IDC's HPC competitive segments are based on average selling prices and are defined as follows:

- **Supercomputers:** Technical servers that sell for $500,000 or more
- **Divisional servers:** Technical servers that sell for $250,000–499,999
- **Departmental servers:** Technical servers that sell for $100,000–249,999
- **Workgroup servers:** Technical servers that sell for less than $100,000

Definition of Technical Computing

IDC uses the terms *technical computing* and *high-performance computing* to encompass the entire market for computer servers used by scientists, engineers, analysts, and other groups using computationally intensive or data-intensive computing. Technical servers range from small servers costing less than $5,000 to the large-capability machines valued in hundreds of millions of dollars.

In addition to scientific and engineering applications, the technical computing market includes related markets/application areas such as economic analysis, financial analysis, animation, server-based gaming, digital content creation and management, business intelligence modeling, and homeland security database applications. These areas are included in the technical computing market based on a combination of historical development, applications type, computational intensity, and associations with traditional technical markets.

Market Context

The worldwide high-performance computing market took a number of years to recover from the 2008 global recession. In 2011, worldwide HPC server market revenue was around $10.3 billion (see Figure 1), led primarily by the supercomputer and departmental segments. 2012 was a record year for the HPC server market, with several very large supercomputers being deployed in Europe, North America and Asia (APAC + Japan). The supercomputer segment accounted for more than 50% of the overall market revenue in 2012. Worldwide factory revenue for the high-performance computing technical server market declined by 7.2% in full year 2013 to reach $10.3 billion, although the departmental and workgroup segments of the market grew well in 2013.

FIGURE 1

Worldwide HPC Server Revenue, 2011–2013

Source: IDC, 2014

The supercomputer segment in the HPC market tends to have the highest revenue, given the high ASPs, despite having the lowest unit volume (see Table 1 and Figure 2). The supercomputer segment declined 29.4% year over year to $4.0 billion, accounting for 38.8% of total HPC server revenue in 2013. The workgroup segment exhibits an inverse pattern, with low ASPs and the highest units sold. Over the past year, the workgroup segment and the divisional segment experienced healthy growth. These two segments were part of the HPC segments that were the worst affected during the 2008 recession.

TABLE 1

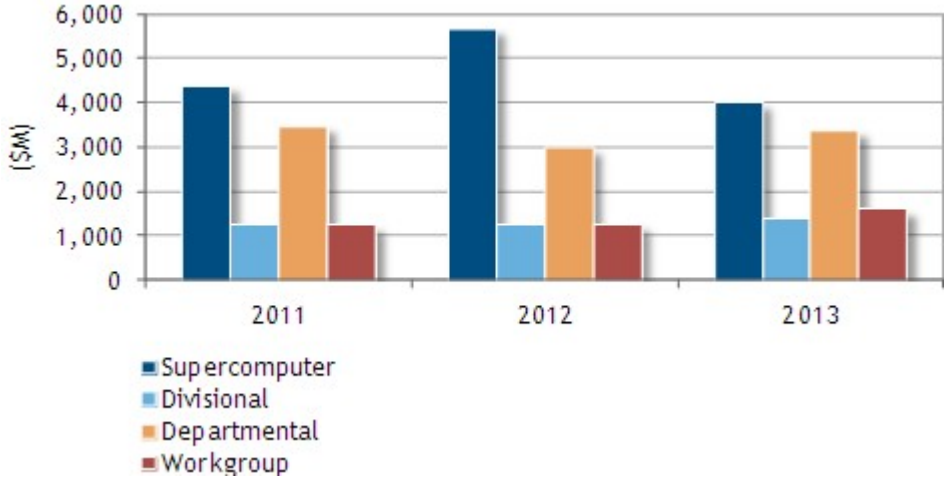
Worldwide HPC Server Revenue by Competitive Segment, 2011–2013 ($M)

	2011	2012	2013
Supercomputer	4,370.2	5,655.0	3,994.7
Divisional	1,236.7	1,216.2	1,355.1
Departmental	3,467.3	2,979.2	3,363.3
Workgroup	1,225.9	1,247.4	1,585.7
Total	10,300.1	11,097.7	10,298.8

Source: IDC, 2014

FIGURE 2

Worldwide HPC Server Revenue by Competitive Segment, 2011–2013



Source: IDC, 2014

The divisional segment grew 11.4% year over year to reach $1.4 billion, or 13.2% of the total HPC server revenue for 2013. The departmental segment expanded by 12.9% to $3.4 billion, or 32.6% of total 2013 HPC server revenue. The workgroup segment, HPC systems sold for less than $100,000, showed the strongest growth, expanding 27.1% over 2012 to $1.6 billion, representing 15.4% of all 2013 HPC server revenue.

In the supercomputer segment, units shipped declined 38.1% year over year to 1,484 units (see Table 2 and Figure 3), accounting for 1.2% of total HPC server unit share in 2013. The divisional segment grew 16.6% year over year to reach 4,271 units, or 3.4% of the total HPC unit share for 2013. The departmental segment expanded by 19.2% to 20,246 units, or 16.3% of total 2013 HPC unit share. The workgroup segment, HPC systems sold for less than $100,000, showed the strongest growth, expanding 20.8% over 2012 to 97,981 units, representing 79.0% of all 2013 HPC server units.

TABLE 2

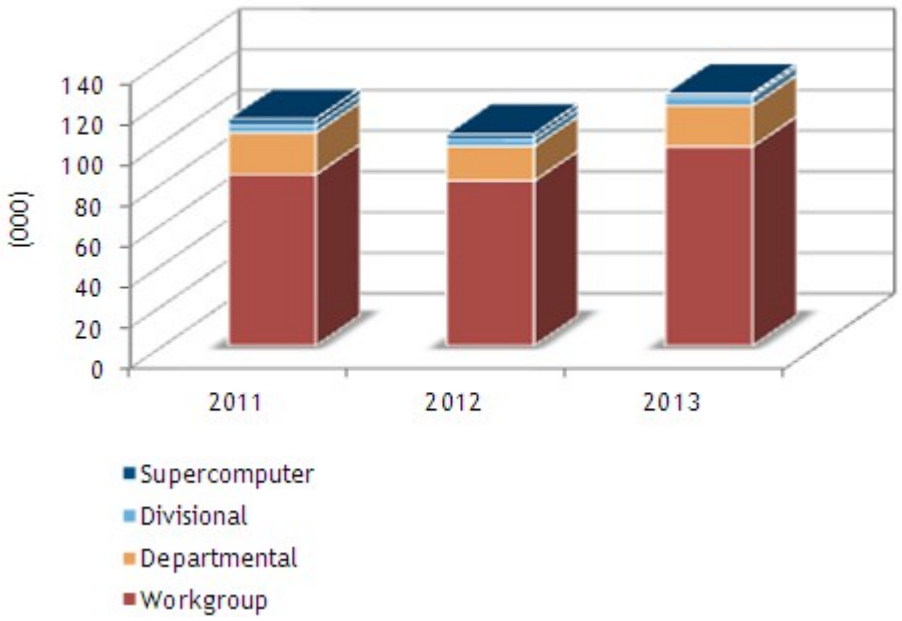
Worldwide HPC Server Shipments by Competitive Segment, 2011–2013

	2011	2012	2013
Supercomputer	2,908	2,400	1,484
Divisional	3,724	3,663	4,271
Departmental	20,625	16,981	20,246
Workgroup	84,294	81,104	97,981
Total	111,551	104,148	123,982

Source: IDC, 2014

FIGURE 3

Worldwide HPC Server Shipments by Competitive Segment, 2011–2013



Source: IDC, 2014

In terms of geographical distribution of worldwide HPC server revenue, North America accounted for 43.9% of the global market but growth declined nearly 6.4% to $4.5 billion year over year in 2013 (see Table 3 and Figure 4). EMEA HPC revenue declined 6.8% year over year to reach $3.1 billion, or 30.1% of the total worldwide HPC revenue share for 2013. APAC (without Japan) HPC revenue grew 20.2% year over year to reach $1.9 billion, or 18.6% of the total worldwide HPC revenue share for 2013. Japan HPC revenue declined 46.8% year over year to reach $663 million, or 6.4% of the total worldwide HPC revenue share for 2013. Japan had a record 2012, primarily driven by the deployment and acceptance of the K system, which had an estimated cost of $530 million. Since there were no repeat installations of similar scale in 2013, the year-over-year data seems more pronounced than normal. The rest of the world (ROW) HPC revenue grew 0.6% year over year to reach $105 million, or 1% of the total worldwide HPC revenue share for 2013.

TABLE 3

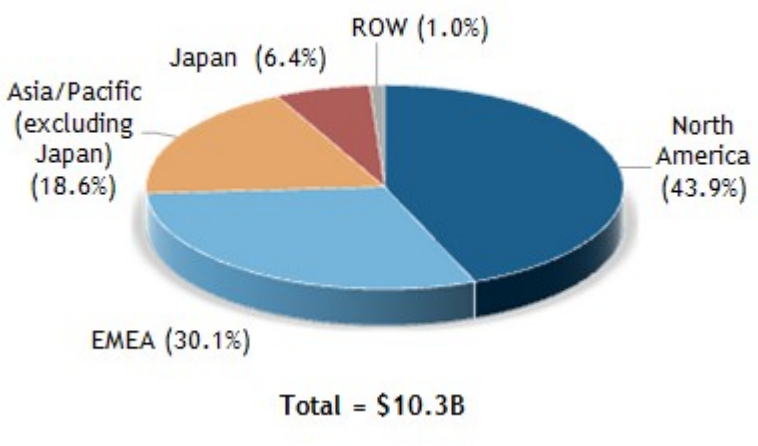
Worldwide HPC Server Revenue by Region, 2011–2013 ($M)

	2011	2012	2013
North America	4,644.5	4,827.5	4,516.4
EMEA	3,209.5	3,327.5	3,102.0
Asia/Pacific (excluding Japan)	1,525.2	1,591.3	1,912.5
Japan	783.2	1,247.4	663.3
ROW	137.7	104.0	104.7
Total	10,300.1	11,097.7	10,298.8

Source: IDC, 2014

FIGURE 4

Worldwide HPC Server Revenue Share by Region, 2013



Source: IDC, 2014

FUTURE OUTLOOK

Growth in the worldwide HPC server market in 2012 was very strong and was driven by strong growth in Japan, EMEA, and North America. In 2012, the K system accounted for more than $0.5 billion in Japan. These unusual levels of high-profile and high-value sales were not repeated in 2013, resulting in a tepid year in HPC as expected. However, this correction in the HPC market sets the stage for further sustained growth in 2014 and beyond. IDC expects the worldwide HPC server market to enjoy a healthy compound annual growth rate of over 7% over the 2014-2017 forecast period, with revenue exceeding $14 billion in 2017.

ESSENTIAL GUIDANCE

Essential Guidance for Vendors

To succeed in the emerging competitive landscape, vendors will have to engage in a broader, more meaningful dialog with buyers. Vendors will have to design solutions that address the buyers' workload pain points while developing systems designed for scalability and expandability. By adding unique differentiators at multiple levels, vendors can position themselves for leadership in the emerging HPC server market landscape.

Essential Guidance for Buyers

Increased competition among the vendors will benefit buyers. Vendors will be more inclined to engage in solutions-oriented conversations with buyers, enabling the development of infrastructures that can address buyer needs more comprehensively. Buyers in the HPC server market should use the comprehensive understanding of their internal workload patterns to conduct highly focused discussions with vendors. Buyers that focus tightly on their existing and planned workloads and work to develop scalable infrastructures to support these real-world workloads are likely to benefit most from the emerging vendor solutions.

LEARN MORE

Related Research

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

- *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 #IcUS24694314, February 2014)
- *IDC's Worldwide High-Performance Computing Predictions 2014* (IDC #WC20140211, February 2014)
- *Seagate Looking for the X Factor in Its Acquisition of Xyratex* (IDC #IcUS24555413, December 2013)
- *Micron Demonstrates Technologies to Address Emerging Challenges in Big Data Applications* (IDC #244843, December 2013)
- *Market Analysis Perspective: Worldwide HPC, 2013 – Directions, Trends, and Customer Requirements* (IDC #244742, December 2013)
- *HPDA Pulse: 2013 Software and Consulting Market Analysis* (IDC #244513, November 2013)
- *HPDA Pulse Results: 2013 Hardware and Storage Market Analysis* (IDC #244493, November 2013)
- *HP FY13: Revenue Declines Abate on Stronger Core Business* (IDC #IcUS24466413, November 2013)
- *Catalyst Supercomputer Heralds Shift to More Balanced Architectures* (IDC #IcUS24437513, November 2013)
- *China Eyes 10,000-Fold Data Reduction for Internet of Things* (IDC #IcUS24392513, October 2013)
- *HPC User Forum, October 2013, Seoul, Korea* (IDC #243786, October 2013)
- *Tools and Techniques for Technical Computing in Life Sciences: HPC User Forum, September 2013, Boston, Massachusetts* (IDC #243778, October 2013)

- *Perspectives on Quantum Computing: HPC User Forum, September 2013, Boston, Massachusetts* (IDC #243777, October 2013)
- *National and International Initiatives: HPC User Forum, September 2013, Boston, Massachusetts* (IDC #243776, October 2013)
- *Issues in High-Performance Computing: HPC User Forum, September 2013, Boston, Massachusetts* (IDC #243775, 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)
- *World's Fastest Supercomputer Set to Reach Customer in Oct 2013* (IDC #lcUS24300913, September 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)
- *10 Things CIOs Should Know About High-Performance Computing* (IDC #241565, 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)

Synopsis

This IDC study discusses the worldwide HPC market dynamics over the 2011–2013 period and beyond. According to the data collected in the worldwide High-Performance Technical Server QView, the factory revenue for the high-performance computing (HPC) technical server market declined 7.2% to $10.3 billion for the full year 2013, down from a record $11.1 billion in 2012. IDC had predicted the decline from 2012, when several extremely large supercomputer sales propelled the high-end supercomputer segment of the market to new heights. IDC expects the worldwide HPC server market to enjoy a healthy compound annual growth rate (CAGR) of over 7% over the 2014–2017 forecast period, with revenue exceeding $14 billion in 2017.

"HPC servers have been closely linked not only to scientific advances but also to industrial innovation and economic competitiveness. For this reason, nations and regions across the world, as well as businesses and universities of all sizes, are increasing their investments in high-performance computing," said Earl Joseph, program vice president for Technical Computing at IDC.

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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