

## Quick Take

# A View of the 2018 HPC Market by Competitive Segments

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### HYPERION RESEARCH OPINION

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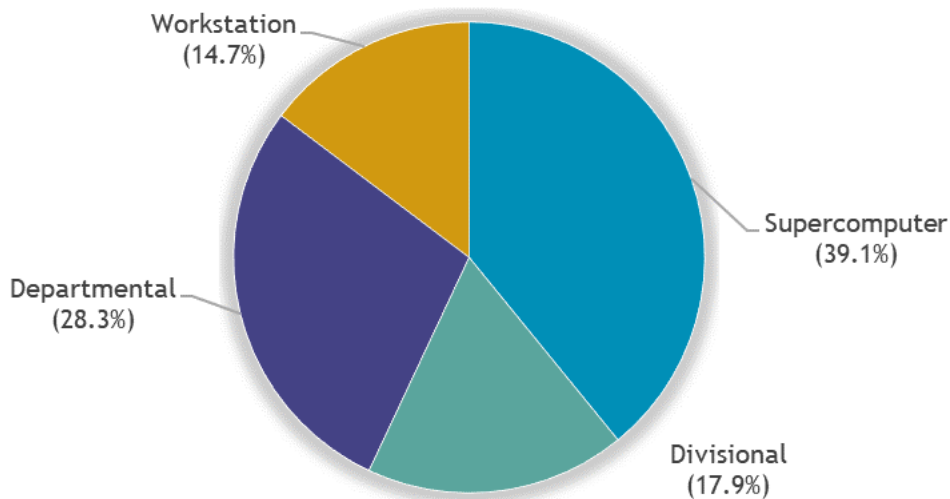
Hyperion Research recently closed the books on the 2018 year for the high performance computing market in our market tracking database, the QView, as well as the Country Level Database, which tracks the HPC markets in 26 countries around the world as well as 13 different verticals. 2018 was another high growth year, with the server market reaching \$13.7 billion, and the total market (servers, storage, software and technical support service) totaling more than \$27.6 billion. The market has continued to grow at a steady rate of around 6% for the past 5 years.

Although there is a wide range of data built into the QView and the Country Level Database, which contains all the HPC sales for the past 25 years, this series of reports highlights some of the key trends and numbers of the QView. This Quick Take shows the four competitive segments of the HPC market, as defined by the different price bands: Supercomputer (>\$500K), Divisional (\$250K - \$500K), Departmental (\$100K - \$250K) and Workstation (<\$100K). As seen below in Figure 1, the Supercomputer segment makes up almost 40% of the worldwide HPC market, while the Departmental segment makes up just more than a quarter of the market.

### FIGURE 1

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#### Worldwide HPC Market by Competitive Segments



Source: Hyperion Research, 2019

Table 1, below, shows the revenues of each segment as well as the historic five year CAGR for each segment. It is important to note that while the market is growing well right now, there was a small dip in the market a few years ago, so the five year CAGR reflects that dip into the value. The Divisional segment has been growing the fastest over the past five years, more than twice the rate of any other segment.

**TABLE 1**

**2018 Worldwide HPC Revenues by Competitive Segment (\$K)**

	2018	5 Year Historic CAGR
Supercomputer	5,361,603	6.1%
Divisional	2,449,270	12.6%
Departmental	3,879,445	2.9%
Workstation	2,015,770	4.9%
Total	13,706,088	5.8%

Source: Hyperion Research, 2019

**FUTURE OUTLOOK**

The Supercomputer segment is poised to grow rapidly over the next five years as the exascale race comes to a head. The first systems are planned to be installed in 2021, all with prices in the range of \$500 million and more. The most notable system being the first US exascale HPC, the \$600 million Aurora 21 going to Argonne National Lab in 2021.

Hyperion Research sees the overall HPC market growing at a strong rate over the next five years, at a rate faster than the last five years. By 2023, the market is expected to be around \$20 billion, with 2022 being a special year of multiple exascale systems being installed across the world. The world may also see the first \$1 billion dollar supercomputer in Japan, the Post-K system. The next five years of the HPC market will be interesting as workloads are evolving with AI/ML/DL/HPDA converging with HPC. Many new customers will enter the market, so the growth will be positive for each segment, with the Supercomputer segment gearing up for a large increase in size.

## APPENDIX: DEFINITIONS USED IN THIS REPORT

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### Definition of Technical Computing (HPC)

Hyperion Research uses the terms *technical computing* and *high-performance computing (HPC)* to encompass the entire market for computer servers used by scientists, engineers, analysts, and other groups using computationally and/or data-intensive modeling and simulation applications.

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, technical computing includes related markets/applications 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.

### Tracking Methodology

Each quarter, Hyperion Research analysts conduct interviews with major hardware original equipment manufacturers (OEMs) in the technical computing space to gather information on each vendor's quarterly sales. Specifically, Hyperion collects data on the number of HPC systems sold, system revenue, system 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.

Hyperion Research records all of the above-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.

Hyperion Research 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. Hyperion refers to this data structure as the "HPC QView." In addition to the HPC QView, Hyperion maintains other HPC technical computing data structures, for example:

- HPC end-user demand-side data structure
- HPC application/industry segmentation data structure
- HPC application software data structure
- HPC server and processor sales by country database

### Hyperion Research Technical Computing Server Revenue Accounting Rules

#### *Initial System Shipment*

Initial system shipment (ISS) characterizes the first sale of a system (previously referred to as a "new footprint"), it also includes major upgrades to existing systems. An ISS unit consists of processors, memory, embedded disk storage, cluster interconnect hardware/software, any bundled operating system, compiler, math/statistical library, parallel computing, database, and networking software that would typically be configured when it leaves the OEM's factory floor. Note that separately acquired

software is not included, e.g. often the database software is purchased separately as is most ISV application software. It is recognized as a shipment only when the complete system or cluster is installed and accepted. In addition, major upgrades that include processors are treated as an ISS in the quarter that it is accepted. External user storage and all paid services are excluded from the ISS revenue value. If a system is paid for over a number of quarters, for example, via service or R&D contracts, Hyperion Research determines a value for the whole system when it is finally accepted by the buyer.

### ***Average Selling Price***

Average selling price (ASP) is the value of an initial system shipment (ISS) unit configured as it is typically sold. A unit is the whole computer system or cluster complex. The ASP includes the base configuration plus any add-ons or upgrades typically sold when the system or server is first delivered to a customer. For upgrade only sales, the ASP is based on the value received by the OEM for the upgrade. This includes the primary system interconnect used for inter-processor communication and any system disks and system software necessary for operation, but not any additional networked-attached storage or additional software packages (e.g., all user application software is excluded). Typically, an HPC system is shipped with large amounts of memory relative to systems sold for nontechnical workloads, which can add significantly to the average selling price. Hyperion assumes that all servers are shipped with an operating system. The portion of the operating system license fee that is shipped with the server is included in the factory-revenue figures, if paid to the OEM. Note that often in HPC the OS is free, so that its inclusion doesn't change the ASP.

The value of the system and the units associated with the sale are only counted when the system is installed and accepted. At this point the full value of the contract is recognized.

Neither ISS nor ASP should include the following:

- Any external storage purchased separately from the initial server system
- Any extra services purchased for the initial server system shipped
- Any application software, regardless of whether the application software is part of the contract or not
- Any additional sales revenue from the channel (Hyperion does not count revenue coming from the channels and partners of the original equipment manufacturers or original system integrators [OSIs]. All revenue Hyperion counts should be based on direct sales from the OEMs and OSIs.)

### **Hyperion Research Technical Computing Market Segmentation**

Based on input from HPC vendors and end users, Hyperion Research created four competitive segments to reflect the trends in the HPC technical server market. These competitive segments are based on average selling prices and 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

## About Hyperion Research, LLC

Hyperion Research provides data-driven research, analysis and recommendations for technologies, applications, and markets in high performance computing and emerging technology areas to help organizations worldwide make effective decisions and seize growth opportunities. Research includes market sizing and forecasting, share tracking, segmentation, technology and related trend analysis, and both user & vendor analysis for multi-user technical server technology used for HPC and HPDA (high performance data analysis). We provide thought leadership and practical guidance for users, vendors and other members of the HPC community by focusing on key market and technology trends across government, industry, commerce, and academia.

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