

## Quick Take

# HPC Public Cloud Market Spending Size and Forecast, 2013-2022

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## HYPERION RESEARCH OPINION

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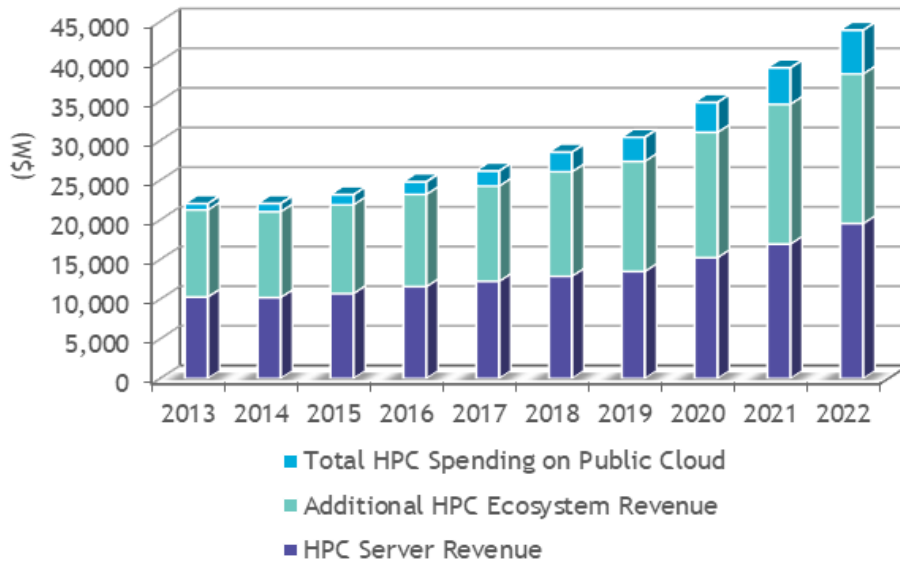
Hyperion Research has been tracking the public cloud market for many years now. This report focuses on the market for public cloud usage by HPC user organizations, developed from data over many years of surveys and interviews with users. Hyperion Research estimates that end user spending for HPC usage in public clouds was just under \$1.9 billion in 2017. Given the healthy growth rates of the past five years and our projected continuation of strong growth, we project end user spending on HPC in public clouds will be over \$5.5 billion by 2022. When this cloud figure is added to the spending for HPC servers, middleware, applications, storage and services, we project that the overall HPC market will grow from \$26 billion in 2017 to \$44 billion in 2022, as shown in Figure 1. Without the cloud usage spending, the figure for 2017 was \$24.3 billion and the 2022 projected amount would be \$38.4 billion.

To date, HPC usage in public clouds has been wider than deep. While the percent of all HPC sites running one or more workloads in a public cloud jumped from 13% in 2011 to 64% in 2017, the average percent of the sites' total HPC workloads sent to public clouds has risen more slowly and currently stands at just less than 10%. Hyperion Research's recent private studies of HPC use in public clouds consistently indicate that about 40% of HPC sites worldwide do not run any of their workloads in public clouds. Data security remains the primary obstacle despite steady improvements by cloud services providers (CSPs).

There are signs that the sector is approaching an acceleration in the yearly growth curve. First, our recent studies show that on average, the roughly 60% majority of HPC sites that exploit public clouds will increase the fraction of all their HPC workloads run in public clouds from today's sub-10% to 14-15% in just the next two years. Second, and in the long run more important, major CSPs are now competing to make their offerings friendlier to a broader spectrum of HPC workloads by enhancing their architectures with more-capable networking (e.g., "direct connect" options), greater processor choices, and more-effective software stacks. Smaller, intermediary CSPs are doing an admirable job of helping HPC users move appropriate workloads to public cloud environments.

**FIGURE 1**

**Total HPC Ecosystem Spending, including Public Cloud**



Source: Hyperion Research, 2018

**SITUATION OVERVIEW**

Hyperion Research has been tracking HPC usage and spending in public clouds since 2011 through surveys and interviews. This forecast and market sizing is for user spending on HPC jobs with public cloud providers, drawn from interviews and surveys with end users over the past five years. We project that public cloud revenues for HPC usage will have healthy growth out to 2022, following its strong growth from 2013 to 2017. With the widening availability of hardware and software, public clouds provide a versatile environment for many HPC users. By our definition, a public cloud is any large, third-party cloud located outside of an organization's firewall and that is accessible in return for payment by anyone over the Internet.

**Historic Spending in Public Clouds**

Table 1 shows the historical market size of user spending on HPC in public clouds. The CAGR for the 5-year period is 21%, displaying the healthy growth we have seen in the public cloud market.

**TABLE 1****Historical Spending in Public Clouds for HPC Applications**

\$ M	2013	2014	2015	2016	2017	2018	CAGR 13-18
Total HPC Spending on Public Cloud \$ M	791	1,027	1,265	1,581	1,898	2,466	21%
Yearly Growth Rate		29.9%	23.2%	24.9%	20.1%	29.9%	

Source: Hyperion Research, 2018

**Projected Spending in Public Clouds**

Table 2 shows our projection of the market to 2022. Based on historical data, interviews and surveys, our knowledge of the HPC ecosystem, and insights into future market technology and market trends, we project the market size to be over \$5.5 billion in 2022 with a strong CAGR for the five-year projection of just less than 24%.

**TABLE 2****Projected Spending in Public Clouds for HPC Applications**

\$ M	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR 17-22
Total HPC Spending on Public Cloud	791	1,027	1,265	1,581	1,898	2,466	3,031	3,771	4,585	5,520	23.8%
Yearly Growth Rate		29.9%	23.2%	24.9%	20.1%	29.9%	22.9%	24.4%	21.6%	20.4%	

Source: Hyperion Research, 2018

**The Overall HPC Market Including All Types of Spending**

Table 3 shows the entire HPC ecosystem with the addition of spending in public clouds, projected to 2022. By 2022, including public clouds, the entire revenue of the HPC ecosystem is projected to grow from \$26 billion in 2017 to almost \$44 billion, with a strong 10.9% CAGR for 2017-2022.

**TABLE 3****Total HPC Ecosystem Spending, including Public Cloud**

\$ M	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR 17-22
Entire HPC Ecosystem Revenue	21,266	21,037	21,914	23,227	24,274	26,080	27,388	31,053	34,588	38,411	9.6%
HPC Server Revenue	10,299	10,222	10,727	11,595	12,262	12,902	13,510	15,256	16,966	19,557	9.8%
Total HPC Spending on Public Cloud	791	1,027	1,265	1,581	1,898	2,466	3,031	3,771	4,585	5,520	23.8%
Total HPC Ecosystem Spend Including Public Cloud	22,057	22,064	23,179	24,807	26,172	28,546	30,419	34,824	39,173	43,930	10.9%

Source: Hyperion Research, 2018

**FUTURE OUTLOOK**

The future of HPC spending in public clouds looks bright, as the cloud services providers are working to create a more versatile and high-performance environment for a diverse number of HPC, HPDA, and AI workloads. As edge computing, AI, and 5G evolve in the coming years, public clouds will also play a crucial role in the deployment of the edge computing ecosystem.

- Some of the most economically important AI use cases, such as automated driving systems and precision medicine, will require closely coupled environments that combine local computing and low-latency communications (e.g., car to car) with higher-latency, cloud-based computing and communications (e.g., urban traffic management).
- As public cloud offerings become more versatile, address the issues around data security and movement, and the cost of movement to the cloud reaches a stable point, it will be a viable and strong option for even more HPC users, from SMBs to large corporations. Hyperion Research expects users from across all segments of the market to run more of their computations in public clouds.

## 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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