

The Long-Range Forecast for Exascale Computing

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EXECUTIVE SUMMARY

This Intersect360 Research report presents a long-range forecast for the market for Exascale-class systems in the High Performance Computing (HPC) market. While Intersect360 Research generally publishes five-year forecasts, this model necessarily considers a longer range, as a stable market for Exascale-class systems will take additional time to develop.

Because a specific definition is lacking, the debate over what constitutes an Exascale-class system will continue, especially as the threshold is neared, and crossed, by competing programs. Over time, as Exaflops become more common, the debate will wane, and the most common definitional requirements will be achieving delivered Exaflops on some benchmark and having scientific applications that scale.

Intersect360 Research typically forecasts defined market segments for five years from the last completed year; current forecasts for HPC and supercomputing extend to 2022 and the first Exascale systems will appear within this timeframe.

Exascale forecasting presents a challenge on two fronts. First, it is not a segment defined by a particular budget size. Over time, Exascale computing will become easier to afford, and it will become a larger part of the market. Second, the market for Exascale computers does not currently exist, and it will be inchoate in the near term.

It is most useful, then, to think about the long-term prospects for the Exascale computing market beyond the next five years. To model this long-range forecast, Intersect360 Research assumed a stable long-term growth rate for supercomputing and modeled price/performance increases over time based on what we have observed recently with Petascale systems.

There will be five to nine Exascale systems in the world by 2023, depending on funding and delivery to major national initiatives. Based on the variability and uncertainty surrounding these first Exascale systems, we cannot assess a market value for Exascale systems in this timeframe. Rather, the five-year period 2018 – 2022 is important in establishing the capability and creating the technologies that will eventually make their way into the rest of the market.

For the five years 2023 to 2027, we conclude that the market for Exascale systems will remain volatile, but with sales hovering around \$400 million per year—higher or lower based on individual system prices and the exact number of systems sold. Variability in “market size” notwithstanding, \$400 million could be comprised of two systems at \$200 million each in 2023, and 12 systems at \$35 million each in 2027, with the price of an average Exascale system falling 35% per year.

In the 2030s, the market for Exascale systems becomes a growth market, as these supercomputers become adoptable tools for industrial markets. By 2035, the entire supercomputer segment could be comprised of Exascale systems.

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