

The Evolution of the Blue Gene/L Supercomputer

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Abstract. The Blue Gene project started in the final months of 1999. Five years later, during the final months of 2004, the first Blue Gene/L machines were being installed at customers. By then, Blue Gene/L had already established itself as the fastest computer in the planet, topping the TOP500 list with the breathtaking speed of over 70 Teraflops. Since the beginning of 2005, many other systems have been installed at customers, the flagship machine at Lawrence Livermore National Laboratory has greatly increased in size, and Blue Gene/L has established itself as a machine capable of breakthrough science.

We here examine how Blue Gene/L came to be. We describe how some key technical decisions were made that shaped the overall hardware and software architecture of this machine. We also describe the nature of the interactions between the teams inside and outside IBM that led to Blue Gene/L being such a successful venture. Finally, we explain why this is just the beginning, and why there is more excitement ahead of us than behind us in the Blue Gene project.