

C.5 Supercomputers

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A **Supercomputer**¹⁾ is a computer performing at or near the currently highest operational rate for computers. Traditionally, supercomputers have been used for scientific and engineering applications handling very large databases or do a great amount of computation (or both). Although advances like multi-core processors and GPGPUs (general-purpose graphics processing units) have enabled powerful machines for personal use (see: desktop supercomputer, GPU supercomputer), by definition, a supercomputer is exceptional in terms of performance.

At any given time, there are a few well-publicized supercomputers that operate at extremely high speeds relative to all other computers. The term is also sometimes applied to far slower (but still impressively fast) computers. The largest, most powerful supercomputers are really multiple computers that perform parallel processing. In general, there are two parallel processing approaches: symmetric multiprocessing (SMP) and massively parallel processing (MPP).

As of June 2016, the fastest supercomputer in the world was the Sunway TaihuLight, in the city of Wuxi in China. A few statistics on TaihuLight:

- 40,960 64-bit, RISC processors with 260 cores each.
- Peak performance of 125 petaflops (quadrillion floating point operations per second).
- 32GB DDR3 memory per compute node, 1.3 PB memory in total.
- Linux-based Sunway Raise operating system (OS).

DIDO Specifics

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¹⁾

Rouse, Margret; Definition of supercomputer, WhatIs.com, Accessed 8 December 2020, <https://whatis.techtarget.com/definition/supercomputer>

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