



High Performance Networks: From Supercomputing to Cloud Computing (Paperback)

By Dennis Abts, John Kim

Morgan Claypool Publishers, United States, 2011. Paperback. Condition: New. Language: English . Brand New Book. Datacenter networks provide the communication substrate for large parallel computer systems that form the ecosystem for high performance computing (HPC) systems and modern Internet applications. The design of new datacenter networks is motivated by an array of applications ranging from communication intensive climatology, complex material simulations and molecular dynamics to such Internet applications as Web search, language translation, collaborative Internet applications, streaming video and voice-over-IP. For both Supercomputing and Cloud Computing the network enables distributed applications to communicate and interoperate in an orchestrated and efficient way. This book describes the design and engineering tradeoffs of datacenter networks. It describes interconnection networks from topology and network architecture to routing algorithms, and presents opportunities for taking advantage of the emerging technology trends that are influencing router microarchitecture. With the emergence of many-core processor chips, it is evident that we will also need many-port routing chips to provide a bandwidth-rich network to avoid the performance limiting effects of Amdahl's Law. We provide an overview of conventional topologies and their routing algorithms and show how technology, signaling rates and cost-effective optics are motivating new network topologies that scale up...



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