The Challenge of Green HPC

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The focus on power and thermal issues in computing over the last decade has resulted in substantial improvement in energy efficiency from chips up to entire data centers. However, the ever increasing demand for computing for high end computing applications have outpaced our ability to design HPC systems that can meet the desired power/thermal profiles. In this talk, I will address the unique issues faced by HPC in delivering the required performance without hitting the power wall in terms of absolute power consumption and unsustainable power densities. I will also discuss a variety of approaches currently being investigated to addresses these issues including application specific architectures, reduced data movement, near-threshold operation, holistic power management, new technologies, energy adaptation, and better software design.

Speaker Bio:

Dr. Krishna Kant is currently a visiting research professor at Center for Secure Information Systems at George Mason University, and also serving as a program director in the CISE/CNS division of the National Science Foundation. His current areas of research include power/thermal issues in data centers, robustness in the domain name service, and cloud computing security. From 1997 until 2008 he was with Intel corporation, working primarily in a variety of server technologies. From 1991 to 1997, he was with Telcordia Technologies (formerly Bellcore) and worked on SS7 signaling and congestion control. Prior to 1991, he was an Associate Professor of Computer Science at Penn State University. He is the author of the graduate text book *Introduction to Computer System Performance Modeling*, McGraw Hill 1992. He received his Ph.D. degree in Computer Science from University of Texas at Dallas in 1981.