



Department of Computer Science

“Adventures in Green Computing for HPC and Beyond “

Dr. Kirk W. Cameron
Associate Professor, Virginia Tech.

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Abstract

Green computing is now in vogue. This is a recent phenomenon. Historically, supercomputer and data centers worried little about power requirements and costs as they were seen as trivial compared to acquisition and personnel costs. Today, the problems are obvious and acute. ORNL had to work with the Tennessee Valley Authority to build a power substation to support the tens of megawatts used by its Leadership Computing Facility. Mega-data centers such as those built and operated by Microsoft and Google use the same amount of electricity as a small city and could each be responsible for as much as 100 metric tons of CO₂ released into the atmosphere every year.

Over the past decade, the SCAPE Laboratory has pioneered green computing in HPC through design and promotion of techniques to improve server energy efficiency without sacrificing performance. In this talk we describe the motivation and challenges facing the Green Computing movement in HPC and beyond and our past and current efforts to build infrastructure to profile, analyze, control, and optimize the energy used by high-performance systems and applications.

Brief Biography

Kirk W. Cameron received the Ph.D. in Computer Science from Louisiana State University (2000) and B.S. in Mathematics from the University of Florida (1994). Since 2005, he has been an Associate Professor at Virginia Tech and was named a Faculty Research Fellow for the VT College of Engineering in 2007. Other accolades for his research include NSF and DOE Career Awards and an IBM Faculty Award. Prof. Cameron is a pioneer and leading expert in Green Computing. His "Green" credentials include: Green IT columnist for IEEE Computer, Green500 co-founder, SPECPower co-founder, EPA consultant, and Uptime Institute Fellow. Cameron also co-founded MiserWare, Inc. to increase the impact of techniques resulting from his funded research.