

Optimized Power Management™ Bibliography

External Scientific Publications documenting the physics behind the three "Parasitic Energy-Wastage Mechanisms" that are triggered by warming the ambient air for modern IT air-cooled server and storage assets: CPU/GPU Leakage Power, Fan Motor Power, and System Ambient Vibrations.

- "Simware: A Holistic Warehouse-Scale Computer Simulator," Georgia Tech Journal Paper, IEEE Compute Journal (0018-9162/12), 2012. [Shows that as data center temperature rises, fan motor power in the IT assets rises significantly, wasting energy and distorting the facility PUE.]
- "Thermo-Mechanical Coupling Induced Performance Degradation in Storage Systems," S. Sondur, K. C. Gross, and K. Kant, 20th IEEE/ACM International Symposium on Cluster, Cloud, and Internet Computing, Melbourne, Australia (May 11-14, 2020).
- "Leakage-Aware Workload and Cooling Management for Improving Server Energy Efficiency," M. Zapater, O. Tuncer, J. L. Ayala, J. M. Moya, K. Vaidyanathan, K. C. Gross, and A. K. Coskun, Transactions on Parallel and Distributed Systems Journal (June 29, 2014).
- "Effects of Data Center Vibration on Compute System Performance," Julius Turner, Proceedings of USNIX Workshop on Sustainable Information Technology, San Jose, CA (2010) [*Shows 85% degradation in IO rates for IO-intensive workloads in on-prem data centers*]
- "Intelligent Power Monitoring and Management for Enterprise Servers," K. Vaidyanathan and K. C. Gross, 3rd Berkeley IEEE Symposium on Energy Efficient Electronic Systems (E3S-2013), Oct 28-29, 2013.
- "Impact of Dynamic Voltage and Frequency Scaling on n-Tier Application Performance," GA Tech and Fujitsu Laboratories, Proc. of ACM Conf. on Timely Results in Operating Systems (TRIOS'13), Nov 2013.
- "Leakage-Aware and Temperature-Aware Server Control for Improving Energy Efficiency in Data Centers," M. Zapater, J. L. Ayala, J. M. Moya, K. Vaidyanathan, K. C. Gross and A. K. Coskun, International Symposium on Design Automation and Test in Europe (DATE-2013), Grenoble, Fr. (Apr 2013).
- "Ambient Temperature Optimization for Enterprise Servers: Key to Large-Scale Energy Savings," K. Vaidyanathan, K. C. Gross, S. Sondur, 4th Berkeley IEEE Symposium on Energy Efficient Electronic Systems (S3E-2015), Berkeley, CA

(Oct 28-29, 2015).

- "Data Center Ambient Temperature Optimization for Large-Scale Energy Savings," K. C. Gross, Invited Paper and Keynote Industrial Presentation, EcoCloud Annual Symposium on Enterprise Computing Energy Optimization, EPFL, Switzerland (June 2015).
- "Fan-Speed-Aware Scheduling of Data-Intensive Workloads For Optimal Performance and Energy Efficiency of Data Center Assets," C. S. Chan, Y. Jin, Y. K. Wu, K. C. Gross, K. Vaidyanathan, and T. S. Rosing, Proc. Int'l. Symp. on Low Power Electronics and Design (ISLPED12), Redondo Beach, CA (Jul 2012)
- "Correcting Vibration-induced Performance Degradation in Enterprise Servers," C. S. Chan, B. Pan, K. C. Gross, K. Vaidyanathan, and T. S. Rosing, Proc. ACM 2013 International Green Metrics Conference, Pittsburgh, PA (Jun 2013)
- "Data Center Cold Aisle Set Point Optimization," Rubenstein and Faist, Microsoft Research, Proc. IEEE ITherm Conference (June 2014).