



## Conference on Enterprise Servers and Data Centers: Opportunities for Energy Savings

Sun Microsystems Conference Facility  
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### Case Study Panel BIOs

**Peter Bannon** joined P.A. Semi in 2004 with more than 20 years of experience in CPU architecture and design. He was previously at Intel Corporation as an Intel Fellow, working on Itanium platform design.

Prior to that, Bannon was with Compaq Computers, where he served as the lead architect on the Alpha 364 and was named a Compaq Fellow. From 1984 to 2003, Bannon worked at Digital Semiconductor, where he was the co-architect of the DEC Alpha 21164 and 21164-A and developed the VAX design. He holds 13 patents and a BS in computer systems design from the University of Massachusetts, Amherst.

**Christian Belady** is a Distinguished Technologist for the High Performance Systems Lab of Hewlett-Packard in Richardson, Texas. He has been responsible for the power & cooling design and strategy of the center's high-end computers. He has published over 20 papers, holds 33 US and 5 foreign patents, and is PE in Texas. Christian has received the IMAPS 1999 William D. Ashman Achievement Award as well as the North Texas 1998-99 Mechanical Engineer of the Year Award. He is also a Fellow and Lifetime Member of the International Microelectronics and Packaging Society (IMAPS). Christian is a fellow of ASME and an active member ASHRAE where he is a Vice-Chair of the "TC9.9 - Mission Critical Facilities, Technology Spaces & Electronic Equipment" technical committee which is chartered to develop guidelines for data centers.

Prior to 1995, Christian worked for IBM and then TI. He was also the principal investor, director and business advisor to CompuSeis, Inc. located in Austin, Texas from 1991 until it was acquired by Input/Output in 1998. Christian has a BS in ME from Cornell, an MS in ME from RPI, and a business degree from UTD.

Ecard: <http://www.ecardfile.com/id/cbelady>

**Mikhail Guz**, Director of Strategic Marketing and Applications Engineering for Power-One Inc., received the BSEE from the Kharkov Polytechnic Institute (Ukraine) in 1985. He worked in Ukraine for 7 years where he developed power electronics equipment for industrial, transportation, and aerospace applications. After coming to the US, Mikhail joined a Bay Area power supply manufacturer where he led their design engineering team in the development of DC/DC converters.

During 1998-1999, Mr. Guz managed the power supply group at Apple Computer where he had overall responsibility for power supplies for the entire line of Macintosh desktops.

At Power-One as senior technology and marketing leader, Mr. Guz established product roadmaps for the company, including both POLs and power semiconductors. He defined basic strategies and components of Z-One digital power architecture.

**Mukesh Khattar, Ph.D., PE**, Oracle USA, manages electric utility infrastructure at Oracle Corp. Oracle owns a 15 MW substation that feeds head quarter buildings. He is also responsible for strategic planning for energy management and controls, and oversees programs for load management and power demand curtailment.

Dr. Khattar prepared Oracle facilities (lighting, HVAC and miscellaneous electrical systems) with the capability to shed electrical load quickly with least possible impact to business operations in order to participate in the state's Optional Binding Mandatory Curtailment (OBMC) Program. The OBMC program has severe penalties for non-compliance; however, it offers exemption from rolling blackout. He spearheaded SVMG and CMTA efforts to adopt changes to the 10-days rolling average load profile concept to make it fairer for OBMC program compliance. Oracle's energy bills have been reduced by over \$4.0 millions since the onset of the energy crisis in 2001. He lead Oracle's environmental stewardship efforts in joining EPA Green Power, California Sustainable Silicon Valley Initiative and EPA Climate Leaders programs.

Dr. Khattar has over 30 years experience in the fields of energy and building heating, ventilating, air conditioning, and refrigeration systems that are some of the largest energy users in commercial buildings. Prior to joining Oracle in 2001, Dr. Khattar managed research, development and demonstration of advanced technologies and solutions in the commercial HVAC&R area for the Electric Power Research Institute in Palo Alto, CA. Several technologies developed by him —dual path solutions to address indoor air quality and dehumidification, adaptive demand defrost controls for refrigerated display cases, etc.—are becoming widely implemented in the industry. Prior to joining EPRI in 1989, Dr. Khattar was a principal research engineer at the University of Central Florida's Florida Solar Energy Center where he developed the innovative use of NASA space program-derived heat pipe technology for air conditioning and dehumidification applications.

Dr. Khattar has authored over 75 technical reports, peer-reviewed papers and trade press articles. He was a speaker at several national and international conferences and meetings. He has a patent on heat pipes and has won ASHRAE (American Society of Heating, Refrigerating and Air conditioning Engineers) Technology awards in 2003 and 1997, and an ASHRAE Energy award in 1989.

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**Michael K Patterson** is a Thermal Research Engineer working in the Digital Enterprise Group at Intel Corporation, Hillsboro, OR, where he is responsible for pathfinding for thermal solutions for Intel's next-generation server, client, storage, and communications products. The work covers silicon level activity, through system/platform level solutions, and on up to interface with Data Center cooling strategies. He did his undergraduate work at Purdue University, received his MS degree in Management from Rensselaer Polytechnic Institute, and was awarded his MS and PhD in Mechanical Engineering from the University of Vermont. His current technical interests include microchannel cooling, advanced closed-loop cooling systems, and server/datacenter interaction. He has been with Intel for 11 years. He is a registered Professional Engineer and is also a member of ASHRAE and ASME.