

# Energy Management in Cloud Data Centers

## Overview

With the increasing demand for cloud services, the data centers continue to grow in size and number, and hence their collective energy footprint. The high-energy consumption of data centers is a problem from several perspectives including architectural limitations, heat removal challenges, and cost of electricity. The changing nature of data centers, and the technology that impacts them, makes it even more critical that IT professionals, engineers, designers and networking professional remain up to date on the current theories and best practices for issues around topics of power, cooling, efficiency, management, and design of data centers and the underlying enabling hardware and software technologies.

This unique course will provide up to date information and present the energy management in real, virtualized and leased environments. The course will provide a comprehensive discussion of the following research topics: architecture of and energy use in data modern centers, silicon technology trends and energy related challenges, power and energy management at different levels and temporal granularities including hardware, software, and entire data center, power management in virtualized, leased and multitenant environments, need for energy adaptation and coordination, multilevel power management, data center network fabrics and their power management, storage and storage network power management, and emerging challenges in data center hardware, software, and infrastructure design.

<b>Modules</b>	<p>Course Duration: <b>25<sup>th</sup>-29<sup>th</sup> December, 2017</b></p> <p>This course will cover following modules:</p> <p><b>Module I: Introduction: Data Center architecture, Power Wall, and power management basics</b> <b>Module II: Power Management at hardware, software, and data center level</b> <b>Module III: Power Management and adaptation in virtualized data centers</b> <b>Module IV: Data Center Network Fabrics and Power Management</b> <b>Module V: Storage power management and adaptation in data centers</b></p> <p><b>Number of participants for the course will be limited to fifty.</b></p>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"><li>▪ You are an executive/ engineer/ research scientist from manufacturing, service and government organizations including R&amp;D laboratories.</li><li>▪ You are a student or faculty from academic institutions interested in learning how to do research on energy management in cloud data centers.</li></ul>
<b>Fees</b>	<p>The participation fees for taking the course is as follows:</p> <p><b>Participants from abroad : US \$100</b> <b>Industry/ Research Organizations: Rs. 5000/-</b> <b>Faculty Members from Academic Institutions: Rs. 2500/-</b> <b>Research Scholars/Students: Rs. 1000/-</b></p> <p>The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.</p>

## The Faculty



**Professor Krishna Kant**, is an IEEE Fellow and professor in the Computer and Information Systems (CIS) department at Temple University, Philadelphia and director of a new NSF IUCRC site "center for research in energy and configuration management". During 2008-2013, he served as a program director in the Computer and Networks Systems (CNS) division cluster of CISE/CNS division. He also worked for Intel Corporation on future server architectures and technologies. He was elected as a fellow of the IEEE for contributions to enterprise server performance and power management technologies and Domain Name System Robustness. At NSF, he was also instrumental in the development and running of NSF wide sustainability initiative called SEES (science, engineering and education for sustainability). He has also served at Northwestern University, Penn State University, Bell Labs, Bellcore, and Intel, and carries a combined 34 years of experience in academia, industry, and government. He has published in a wide variety of areas in computer science, authored a graduate textbook on performance modeling of computer systems, and co-edited two books on infrastructure and cloud computing security. His current areas of research include sustainability and energy efficiency in data centers, configuration robustness and security, and application of computing technologies to larger sustainability problems. His research on energy issues in data center design and performance in high performance computing is widely recognized as pioneering.

More details: <http://www.kkant.net>

## COURSE CO-ORDINATOR

**Dr. Rajiv Misra** is an Associate Professor in Department of Computer Science and Engineering at Indian Institute of Technology Patna, India. His current research interests spanned a design of distributed algorithms for Mobile, Adhoc and Sensor Networks, Distributed Cloud Computing and Wireless Networks. He has contributed significantly to these areas and published more than 60 papers in high quality journals and conferences, and 2 book chapters. His h-index is 9 with more than 500 citations. He has authored papers in IEEE Transactions on Mobile Computing, IEEE Transaction on Parallel and Distributed Systems, Adhoc Networks, Journal of Parallel and Distributed Computing.



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More details:

<https://www.iitp.ac.in/index.php/departments/engineering/computer-science-a-engineering/people/faculty/dr-rajiv-misra.html>

## Course Co-ordinator

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