

# CRITICAL FACILITIES ROUND TABLE

**HOSTED BY:  
HEWLETT-PACKARD LABORATORIES**

September 5<sup>th</sup>, 2003

Location:  
1501 Page Mill Rd  
Building 3-Upper - Main Lobby  
Yosemite conference room  
Direction: <http://web.hpl.hp.com/services/maps/pagemilldirs.html>

## AGENDA

### Morning Session

08:30 - 09:00      Breakfast

09:00 - 09:10      HPL Management Welcome Note (Rich Friedrich)  
09:10 - 09:30      CFRT opening remarks, intro's, review & discussion (Bruce Myatt & Charles Krieger)  
                         HDDC Committee Goals & Objectives (Bruce Myatt)  
09:30 - 09:50      Introduction to Smart Data Centers (Chandrakant Patel)  
09:50 - 10:10      Static and Dynamic Smart Cooling (Cullen Bash)  
10:10 - 10:30      Infrastructure for Smart Data Centers (Monem Beitelmal)  
10:30 - 10:40      Break  
10:40 - 11:00      Measurements and Data Aggregation (Ratnesh Sharma)  
11:00 - 11:20      Power monitoring and delivery (Partha Ranganathan)  
11:20 - 11:40      Smart monitoring and sensing (Malena Mesarina)  
11:40 - 12:00      CFRT HDDC Committee Nominations and Elections Committee Chair, Co-Chair, and  
                         Secretary (Bruce Myatt)

12:00 - 01:00      Lunch

### Afternoon Session

01:00 - 01:15      UDC Tour Introduction (John Sontag)  
01:15 - 02:30      UDC/Lab Tour – Wrap up discussion  
02:30 - 02:45      Closing remarks (Chandrakant Patel)  
02:45 – 03:00      CFRT and HDDC Committee Closing Remarks (Bruce Myatt & HDDC Committee)

Thank you all for your contributions!!

Founders -- Charles Krieger, Bruce Myatt, Horst Pfendt, Steve Johnson

## **Biographies**

### **Cullen Bash**

Cullen is a senior research scientist at Hewlett-Packard Laboratories. His research is focused on the thermo-mechanical architecture of future microprocessors, servers and data centers and encompasses the modeling and metrology of various thermal technologies - from air and liquid-cooled systems to refrigeration and evaporative spray cooling. Cullen joined HP Labs in 1998. Prior to that he contributed to the thermo-mechanical design of HP servers and processor modules, including the T-class, K-class PA-RISC servers, PA-RISC module, and numerous IA-32 servers. Additionally, together with his colleague Chandrakant Patel, he teaches a three-day course in thermal management of electronics at the University of California at Berkeley Extension.

### **Monem Beitelmal**

Monem is a research scientist at Hewlett-Packard Laboratories. His area of expertise is in heat transfer and fluid dynamics. He is involved with several research projects as they relate to the electronics cooling like air jet impingement for heat transfer, sub-cooling and thermal management using rankine vapor compression cycle and two-phase thermosyphon technology. He joined HP Labs as a research intern in 1996 and as full time in 2000. He is currently part of the utility data center infrastructure research team. Monem receives his B.S. from U. Of Portland, M.S. from UC Davis and his Ph.D. from Santa Clara University. He is an adjunct faculty member at Santa Clara University.

### **Rich Friedrich**

Rich leads the Internet Systems and Storage Lab in HP Labs. The ISSL research team focuses on next-generation Internet computing and storage systems, and on inventing distinctive utility computing mechanisms to provide IT infrastructure on demand. He led the teams that invented WebQoS, the novel technology for providing predictable and stable performance for Internet based applications, re-architected Linux for IA-64, and provided key technologies to HP's Utility Data Center. He is a graduate of Northwestern University.

### **Malena Mesarina**

Malena is a hardware engineer at Hewlett-Packard Laboratories. Her research interests are in the design of self-managing sensor networks for building management applications, focusing in the architecture, self-organization and programmability of the network. She received her B.S degree in Electrical Engineering from Boston University, M.S in Computer Science from the University of California at Los Angeles (UCLA).

### **Chandrakant Patel**

Chandrakant leads the thermo-mechanical research in chips, systems and data centers at Hewlett Packard Laboratories. He is responsible for devising the cooling research strategies at Hewlett Packard Laboratories, and has 20 years of industrial experience in mechanical product design, electronics packaging and thermal management. Prior to initiating the current smart data center work, Chandrakant devised thermo-mechanical solutions for chips and systems including then VLIW (now Intel Itanium) microprocessor at HP Laboratories. Chandrakant is a registered professional mechanical engineer in the state of California. He also teaches a thermal management course at U.C.Berkeley extension with Cullen Bash and is an adjunct faculty member in Engineering and CAD at Chabot College since 1990.

### **Partha Ranganathan**

Partha is a research scientist at Hewlett Packard Labs. His research interests are in low-power system design, computer architecture, and performance evaluation. He is part of the SmartPower and Operations team focusing on improving power and operations efficiency in future enterprise computing environments. Partha received his B.Tech degree from the Indian Institute of Technology, Madras and his M.S. and Ph.D. from Rice University, Houston.

**Ratnesh Sharma**

Dr. Sharma has a Masters and Doctorate degree in Mechanical engineering from University of Colorado at Boulder. His research area at Hewlett-Packard Company Laboratories spans development of energy-efficient Internet data centers to cooling technologies for high heat flux microchips.

**John Sontag**

John is a 22 year veteran of HP. A graduate of Carnegie-Mellon, John came to HP in 1979 to work on operating systems, real time computers and disk subsystems. As the chief architect for HP-UX, John led the architectural development of 64 bit support, Itanium Platform Family support and a software that would allow HP-UX to easily support multiple processor and binary families. The growth of Internet data centers led to John leading a team which delivered leadership SpecWeb results and a business unit focused on server appliances. At HP labs, John leads the team responsible for the core of the planetary scale compute utility. The team's research is focused on Linux, load distribution and content distribution, and the assurance and measurement of QoS of rich media streams in the network.

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