Abstract

Power-aware computing has caught the interest of researchers and users of all computing systems. In embedded systems and small devices, better management of energy translates into longer lasting and smaller batteries, which in turn implies smaller and lighter devices. In cloud, distributed, and high performance computing systems, better management of power translates into saving a significant amount of money and natural resources. This paper surveys the different power-aware computing approaches and techniques, focusing mostly on software approaches. It also introduces power-aware computing and why it is very important these days. The paper discusses the ways and challenges of measuring the energy consumption of systems and devices.

References

- Osman S. Unsal, 2008, "System-Level Power-Aware Computing In Complex Real-Time and Multimedia Systems", Doctor of Philosophy, Department of Electrical and
Computer Engineering, University of Massachusetts Amherst.
- Hagen Höpfner and Christian Bunse, 2009, "Towards an Energy Aware DBMS – Energy Consumptions of Sorting and Join Algorithms", International University in Germany, Campus 3; 76646 Bruchsal; Germany
- Chung-Hsing Hsu, 2003, "Compiler-directed dynamic voltage and frequency scaling for CPU power and energy reduction", Doctor of Philosophy, Graduate Program in Computer Science, Rutgers, The State University of New Jersey.
Power Aware Computing Survey

- ABI Research, 2013, “45 Million Windows Phone and 20 Million BlackBerry 10 Smartphones in Active Use at Year-end; Enough to Keep Developers Interested”.

Index Terms

Computer Science  
Information Sciences

Keywords

Power-aware computing  power-aware algorithms  energy consumption  
power-aware compilers  

power-aware cloud computing  

power-aware high performance computing  

measurement tools.