Architectures for Green Routers

Viktor K. Prasanna

University of Southern California
http://ceng.usc.edu/~prasanna

ABSTRACT

As the Information and Communication (ICT) infrastructure continues to evolve, significant energy dissipation is incurred in the core routers. Core router performance will soon be limited by the power density. About two-thirds of the power dissipation in a router is in layer 3. Packet forwarding, classification, etc. contribute significantly to this. This talk explores architectures and algorithms for network functions including deep packet inspection and packet classification in core routers. We propose energy efficient designs to realize the “Green Internet” vision. We illustrate the performance improvements for such systems and demonstrate the suitability of FPGAs for these computations. We show that SRAM based solutions combined with FPGA based architectures lead to high throughput as well as reduced power dissipation compared with the state of the art solutions based TCAMs.

SPEAKER’S BIOGRAPHY

Viktor K. Prasanna (ceng.usc.edu/~prasanna) is Charles Lee Powell Chair in Engineering in the Ming Hsieh Department of Electrical Engineering and Professor of Computer Science at the University of Southern California. He is the director of the Center for Energy Informatics. He is the executive director of the USC-Infosys Center for Advanced Software Technologies (CAST) and is an associate director of the USC-Chevron Center of Excellence for Research and Academic Training on Interactive Smart Oilfield Technologies. His research interests include parallel and distributed systems including networked sensor systems, embedded systems, configurable architectures and high performance computing. He served as the Editor-in-Chief of the IEEE Transactions on Computers during 2003–06 and is currently the Editor-in-Chief of the Journal of Parallel and Distributed Computing. Prasanna was the founding Chair of the IEEE Computer Society Technical Committee on Parallel Processing. He is the steering chair of the IEEE International Conference on High Performance Computing (www.hipc.org). He is a Fellow of the IEEE, the ACM and the American Association for Advancement of Science (AAAS). He is a recipient of 2009 Outstanding Engineering Alumnus Award from the Pennsylvania State University.