

Title: I/O Acceleration in Server Architectures

Speaker: Prof. Laxmi N. Bhuyan

Professor and Chair, Department of Computer Science and Engineering  
University of California, Riverside

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Abstract: The faster growth of network bandwidth compared to that of the CPU performance has led to a growing mismatch between the transmission bandwidth and packet processing speed. To make things worse, the memory system performance improves at an even slower pace than that of the CPU. It is known that network protocol stack in the operating system is the major bottleneck in processing I/O requests in servers. The situation is worse in a virtualized environment. This talk presents detailed timing behavior and architectural characteristics of the TCP/IP protocol while executing in the CPU. We investigate various architectural techniques for incorporation in the server architectures to enhance I/O processing speed. They consist of instruction and data cache optimization, Direct Cache Access (DCA) and design of hardware copy engines among others.

Biography: Laxmi N. Bhuyan is Distinguished Professor and Chairman of Computer Science and Engineering Department at the University of California, Riverside (UCR). Prior to joining UCR in January 2001, he was a professor of Computer Science at Texas A&M University (1989-2000) and Program Director of the Computer System Architecture Program at the National Science Foundation (1998-2000). His current research interests are in the areas of network computing, multiprocessor architectures, router and web server architectures, parallel and distributed processing, and performance evaluation. Dr. Bhuyan is a Fellow of the IEEE, a Fellow of the ACM, a Fellow of the AAAS, and a Fellow of the WIF (World Innovation Foundation). He has been named as an ISI Highly Cited Researcher in Computer Science. He has received several awards including Halliburton Professorship at Texas A&M University, and Senior Fellow of the Texas Engineering Experiment Station. He was also awarded the IEEE CS Outstanding Contribution Award in 1997.