



Morning Tutorials

Sunday, August 14, 2005

Memorial Auditorium, Stanford University

Morning Tutorial

Session Chair: Christos Kozyrakis

Virtual Machines-Architectures, Implementations, and Applications

Authors:

- James E. Smith: Professor, University of Wisconsin at Madison, ECE
- Richard Uhlig: Senior Staff Member, Intel, MRL, Oregon

Abstract:

Virtual machines have emerged as a powerful tool for computer systems designers. They can be used to enhance software interoperability, mobility, and security, as well as providing means for effective hardware resource management.

We survey the spectrum of VM architectures and their applications.

These range from the HLL VMs as exemplified by Java, to process VMs that permit cross-platform execution of conventional binaries, to system VMs which support multiple OS environments on a single platform. We then look at some of the important VM architectures and discuss their implementations and features. We will emphasize architecture and hardware mechanisms that provide efficient support for VMs. Several case studies will be discussed, chosen from both commercial implementations and research project