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Special Guest Lectures

An Opening in the Clouds: Open-source Cloud Computing at UCSB

Chandra Krintz, University of California, Santa Barbara

Associate Professor

Johnston Hall 338
February 21, 2011 - 11:00 am

Abstract:
Cloud Computing is a term coined for a recent trend toward service-oriented computing on cluster-based distributed systems. Such systems provide users with a computing paradigm based on service-level agreements with which users gain access to vast, large-scale resources remotely. Cloud computing has experienced rapid uptake in the commercial sector with companies such as Amazon, Google, Microsoft and others providing "elastic" or "utility" products and services that enable resource virtualization, application and system isolation, large-scale, adaptive resource management, and per-application customization via software infrastructures at different levels of abstraction. These systems however are closed and proprietary which limits both our understanding of execution behavior in these settings as well as the degree of control and customization available to application and system developers. To address this limitation, to enable the use of such systems on local cluster resources (private and hybrid clouds), and to provide the software infrastructure necessary for the investigation of the next-generation of cloud services, technologies, application domains, etc., the cloud computing group from the UCSB computer science department has developed and released as open-source, the AppScale platform-as-service cloud fabric. AppScale is a software ensemble for that both facilitates energy-efficient cloud computing research and implements the Google App Engine (GAE) APIs (emulating the GAE cloud). AppScale operates over virtualized cluster resources, Eucalyptus, and Amazon Web Services (AWS) Elastic Compute Cloud (EC2), automatically, and executes GAE applications without modification. AppScale implements a number of different database back-ends, a map-reduce interface, as well as performance and resource monitoring for automatic scaling. In this talk, we overview AppScale, describe its design and implementation, and discuss the various research directions that our group is pursuing using AppScale.

Speaker's Bio:
Chandra Krintz is an Associate Professor at the University of California, Santa Barbara (UCSB). She joined the UCSB faculty in 2001 after receiving her M.S. and Ph.D. degrees in Computer Science from the University of California, San Diego (UCSD). Chandra's research interests include automatic and adaptive compiler, programming language, virtual runtime, and operating system techniques that improve performance (for high-end systems) and that increase battery life (for mobile, resource-constrained devices). Her recent work focuses on programming language and runtime support for cloud computing. Her group has recently developed and released AppScale -- an open-source platform-as-a-service cloud computing system that implements the Google App Engine (GAE) APIs that facilitates next-generation cloud computing research. Chandra has supervised and mentored over 40 students, has published her work in a wide range of ACM venues including CGO, ECOOP, PACT, PLDI, OOPSLA, ASPLOS, and others, and leads several educational and outreach programs that introduce computer science to young people, particularly those from underrepresented groups. Chandra's efforts have been recognized with an NSF CAREER award, the CRA-W Anita Borg Early Career Award (BECA), and the UCSB Academic Senate Distinguished Teaching Award. Chandra is also an ACM and IEEE Senior Member.